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THE BOSTON
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VOLUME 191 NOVEMBER 13, 1924 NUMBER 20

ORIGINAL ARTICLES

PNEUMOCOCCUS ENDOCARDITIS*

BY EDWIN A. LOCKE, M. D.

[From the Pneumonia Service and Pathological Department of the Boston City Hospital.]

Acute bacterial endocarditis due to the pneumococcus is considered a relatively rare condition although in every large clinic typical cases are occasionally seen. The study of four very striking cases, on the Pneumonia Service at the Boston City Hospital, during the past few years, seems worthy of record.

SUMMARY OF CASES

CASE No. 1. (Case previously reported by Thomas & O'Hara, J. H. Hosp., Bull., 1920, xxxi, 357, p. 417.) *Lobar pneumonia, both lower lobes: septicaemia: abscess right lower lobe: hemorrhagic infarct right upper lobe: old bilateral healed pleuritis: acute vegetative endocarditis of tricuspid valve: focal meningitis: aortitis and arteriosclerosis: splenic tumor. Sputum and blood cultures show pneumococcus type I.* Cultures from heart vegetations and meninges show pneumococcus type undetermined.

M. O'H. Hospital No. 403,745.
Man of 45, admitted May 19, 1920.
Family History unimportant.
Past History—Measles, pertussis and scarlet fever as child. Severe pleurisy in 1917. Influenza in 1918. Alcoholic beverages to excess.
Present Illness—Only very meagre history obtained. Apparently sudden onset with pain in right side and dyspnoea 3 days ago. Cough with rusty sputum. General neuralgic pains and some vomiting.
Physical Examination—Patient delirious and seems critically ill. T. 104; P. 100; R. 40. Chest shows marked emphysematous type with general hyper-resonance except over right lower lobe and a portion of the left lower lobe where there is definite dullness. Over these dull areas, respiration and fremitus are bronchial in type, otherwise the respiration is emphysematous. The heart outline cannot be made out exactly because of the high grade of emphysema. Action regular, sounds are faint, no murmurs heard. White count 16,500. Wassermann test negative.
Xray examination shows consolidation of entire right lower lobe and a portion of the left lower lobe near the hilus.
5-24-20—The patient's general condition seems very much improved but the signs in the lungs remain as on admission. T. 98.6; P. 75. The signs in the heart are unchanged. The sputum and blood culture show Pneumococcus Type I.
6-3-20—Since last note the patient has seemed to improve until the past few days when he has failed rapidly. The temperature is again elevated and the pulse and respiration increased in rate. Examinations of the lungs show some evidence of resolution. The patient has had systematic treatment with Type I anti-pneumococcic serum but without any evidence of beneficial effects. Severe serum sickness resulted from which the patient has now entirely recovered. Lung puncture shows Pneumococcus Type I.
6-9-20—Patient had a severe chill on the 7th, which seemed to be due to the intravenous injections. For the past week there has been partial paralysis of the facial muscles on the right. Xray shows appearances in the region of the right lower lobe suggestive of lung abscess. Over a small area, near the angle of the right scapula, the breath sounds have a distinct amphoric quality, and many medium and consummating rales are heard. The signs in the heart have not changed since entrance.
6-14-20—Repeated examinations of the patient have shown no change in the physical signs. His general condition, however, has become progressively worse. On the 13th, weakness in the left arm developed. Blood cultures on the 6th showed 2,500; on the 11th, 800; and the 13th, 1,100 pneumococcus colonies per c.c. He died at 12:30 today.
Autopsy, No. 20-70. June 14, 1920. (Summary of positive findings.)
The pleural cavities showed old fibrinous adhesions over left posterior wall, and on the right posterior, the lateral and inferior surfaces of the lung being closely adherent to the thoracic wall.
Heart: The pericardial cavity is negative.

*Read before the American Climatological and Clinical Association at Atlantic City, May 2, 1924.

The epicardium contains a greyish-white area ("milk patch"), 3x4 cm. over the right ventricle. The myocardium is greyish-red in color. The tricuspid valve shows a large vegetative mass 4x3x1.5 cm. in diameter, consisting of yellowish-grey slightly friable tissue with small pin-point reddish areas over its surfaces. The mitral valve contains a few slightly elevated yellowish placques. These placques are also found on the aortic cusps and around the orifices of the coronaries. The foramen ovale is not patent.

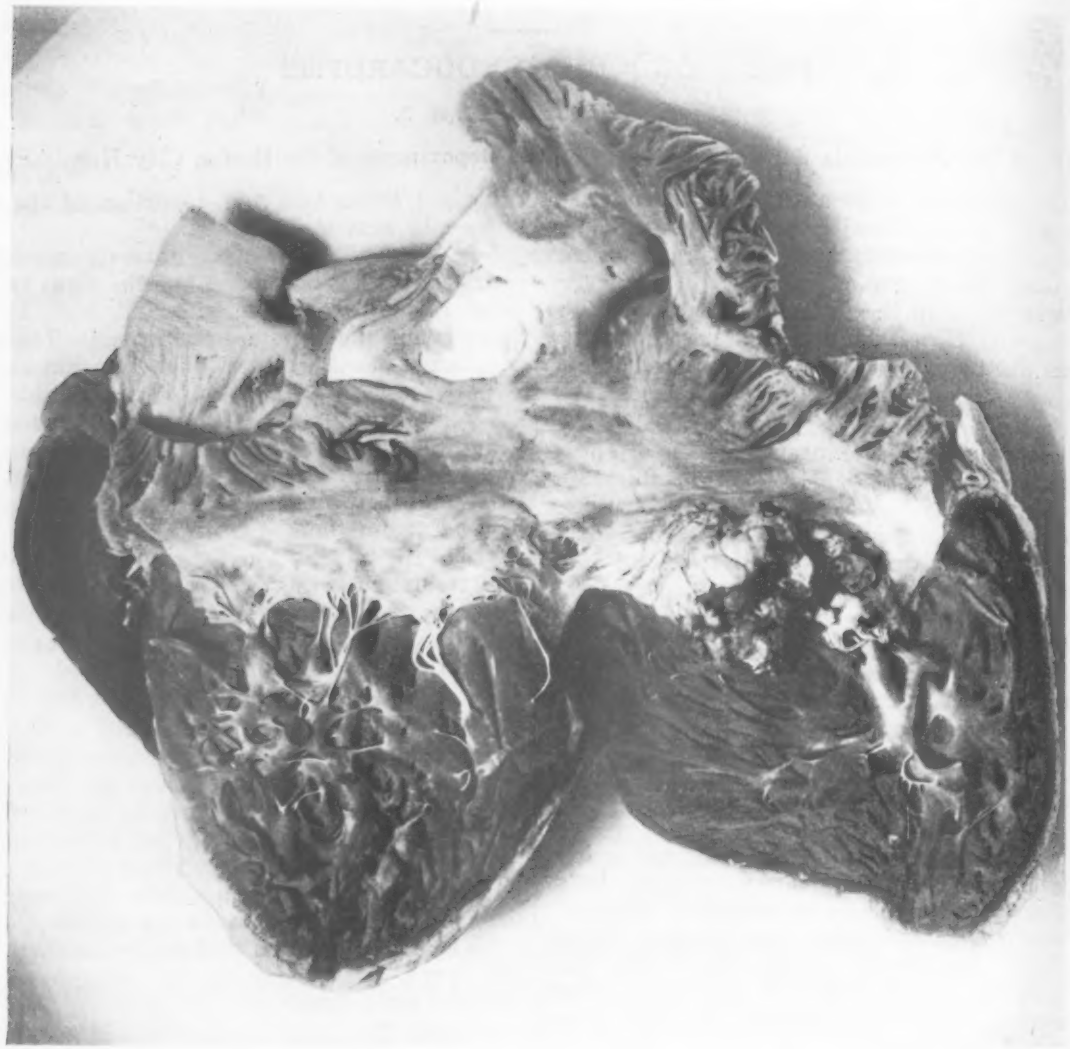


FIG. 1. Case 1. M. O'H. Photograph showing large cauliflower-like acute vegetation of the tricuspid valve.

Measurements: Tricuspid valve 13 cm., pulmonary valve 8 cm., mitral valve 11 cm., aortic valve 8 cm., left ventricle 13 cm., right ventricle 0.4 cm.

Lungs: The right lower lobe and the lower posterior portion of the right upper lobe are dark red in color and somewhat hepatized. On section, the surfaces are firm and granular. The middle lobe and upper anterior portion of upper lobe are crepitant. There is an abscess cavity about 4x3x2 cm. in diameter, situated near the surface in the right lower lobe at the angle formed by the posterior and superior surfaces, lying beneath the angle of the scapula. The left lower lobe is hepatized and dark red in color. On section its surfaces are granular and firm. The upper lobe is crepitant. It contains a triangular shaped, somewhat firm reddish area with its base pointing to the periphery, measuring about 5x3x2 cm. and situated at the anterior surface about the middle of the lobe. The bronchi are congested and the bronchial lymph nodes are enlarged.

Spleen enlarged. Focal meningitis in the region of Broca's area. Examination otherwise negative.

Anatomical diagnoses: Lobar pneumonia of left and right lower lobes and lower portion of right upper: abscess of right lower lobe: hemorrhagic infarct of left upper lobe: right and

left healed pleurisy: acute vegetative endocarditis of tricuspid valve: focal meningitis: slight aortitis and arteriosclerosis: acute splenic tumor.

Bacteriology: Focal meningitis: smear shows gram-positive diplococci.

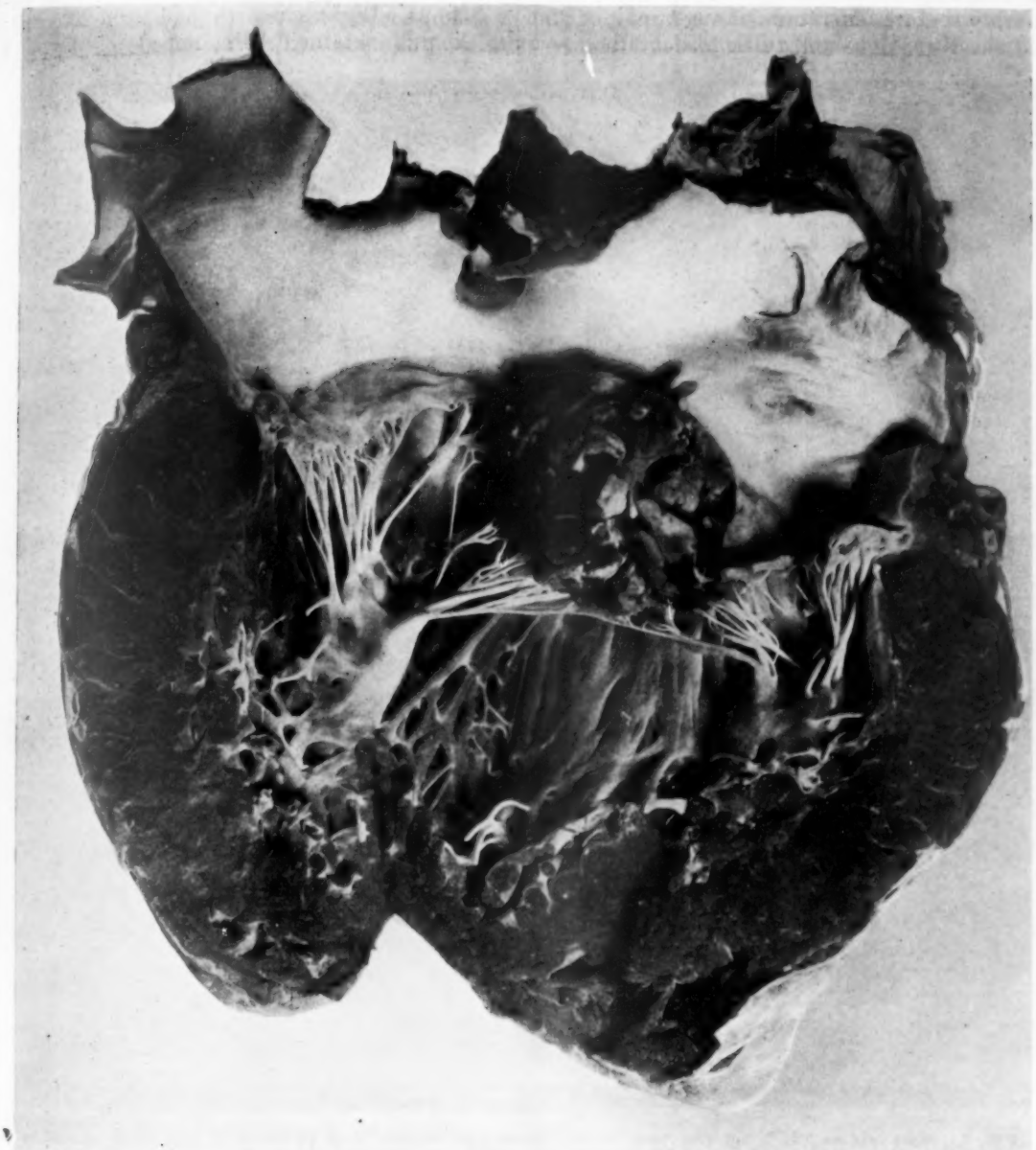


FIG. 2. Case 2. A. McC. Photograph of walnut-sized vegetation on posterior leaflet of the mitral valve seen from the auricular side.

Microscopic Examination: Heart muscle negative. The vegetation on the tricuspid valve consists of fibrin, a few polymorphonuclear leucocytes and lancet-shaped gram-positive diplococci, resembling the pneumococci.

CASE No. 2. *Lobar pneumonia: septicaemia: empyema on right with extensive fibrinous pleuritis on the left: acute vegetative endocarditis of the mitral valve: cardiac hypertrophy: multiple septic infarcts of the liver and kidneys: acute splenic tumor: sputum, blood (ante-mortem and post-mortem), pus from empyema sac and mitral vegetations all show pneumococcus type I.*

A. McC. Hospital No. 416,339.

Man of 31, admitted March 26, 1921.

Family History and Past History—unimportant.

Present Illness—24 days ago sudden onset of pain in the right back, chill and cough. The patient was obliged to leave work immediately and his family physician told him that he had pneumonia of both lower lobes. Crisis on the 10th

day, but he has remained in bed constantly since the onset of his illness. During the past week he has become more and more dyspnoeic, and the pain in his right back has increased. The temperature has been elevated and apparently of an irregular type. The cough, which at first was very severe, has gradually diminished. The day before entrance paracentesis of the right chest was done and thick pus obtained.

lar, but somewhat rapid. No murmur or thrill. Pulses synchronous, equal, of fair volume and tension.

Otherwise the physical examination is not remarkable.

Urine negative. White count 30,000. Sputum, Pneumococcus Type I.

3-28-21—Right chest tapped and 200 c.c. of thick pus obtained (Pneumococcus Type I).

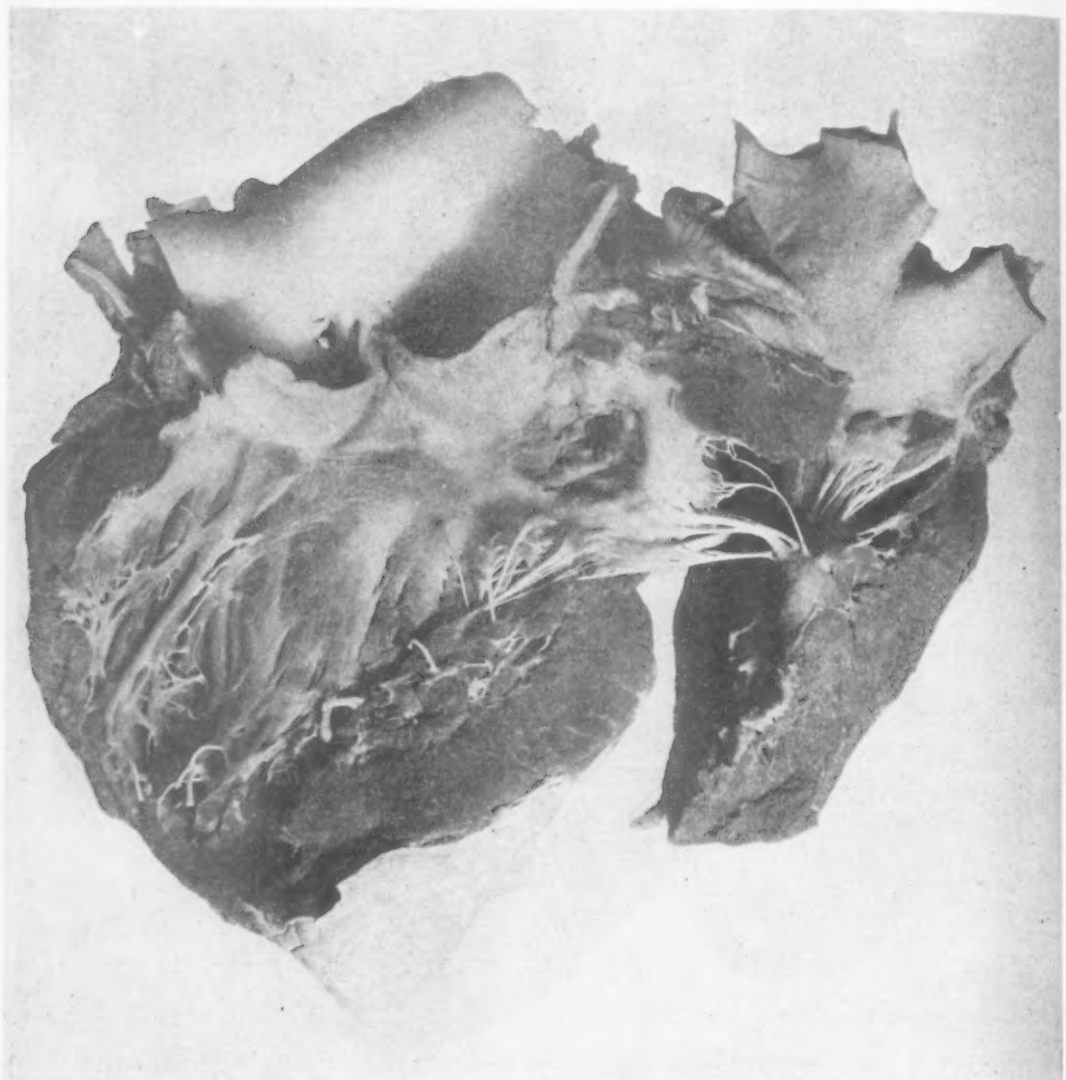


FIG. 3. Same case as Fig. 2, but seen from the ventricular side, showing large ulceration at base of the mitral valve which communicates with the vegetation on the auricular side. Note also congenital deformity of aortic valve.

Physical Examination—The patient seems moderately sick, is very cyanotic and dyspnoeic. Herpes labialis.

The chest is symmetrical but expansion on the right is much less than on the left. The sounds in the lower half of the right chest are those typical of fluid. The left chest shows nothing abnormal.

Heart—The apex impluse is seen and felt in the 4th space, 10 cm. to the left of the median line; right border to percussion 1.5 cm. to right of median line. Sounds are clear, action regu-

Catheter drainage under local anesthesia done on the 30th by Dr. Binney.

4-5-21—The general condition of the patient seems distinctly worse. In spite of effective drainage of the chest, the pulse and respiration show a gradual upward trend. Leucocyte count 16,200. Blood cultures show the pressure of enormous numbers of pneumococci. The appearance of the loud, blowing systolic murmur with maximum intensity at the apex has been noted during the past three days. The area of heart dullness has also increased slightly to the

left. The general course of the disease and the change in heart sounds suggest the probability of an acute endocarditis.

Xray examination indicates that the empyema cavity is draining satisfactorily.

4-8-21—The patient's general condition is less favorable. The heart action is more rapid, the sounds are of poor quality with increasing dyspnoea and cyanosis, and the systolic murmur noted above has increased in intensity. Treatment with Type I anti-pneumococcic serum has been given without evidence of improvement.

4-10-21—Death occurred at 7:30 P. M.

Autopsy, No. 21-49. April 11, 1921.

The left pleural cavity is completely obliterated throughout by many fibrinous adhesions. The right pleural cavity is also obliterated by multiple fibrinous bands and in the lower posterior portion of the cavity is a small amount of organizing pus.

Heart: The pericardial cavity is negative. Weight of heart 310 grams. The epicardium is negative, the myocardium slightly hypertrophied, of a dark color, not friable, auricles not dilated. The tricuspid and pulmonary valves are negative. Firmly attached to the posterior leaflet of the mitral valve and lying slightly above it is a 3x3 cm., walnut-sized, spherical, gray, green, rather friable, soft, cauliflower-like vegetative mass. As the valve is looked down upon from the left auricle this vegetation almost completely fills and obstructs the orifice. It is easily movable, however, and can be swung superiorly and inferiorly upon its attachment to the valve leaflet like a hinge in an arc of about 30 degrees. Chordea tendinae not fibrosed or shortened; papillary muscles negative. The aortic valve is composed of only two large leaflets which are slightly and diffusely thickened but not calcified. Directly beneath one cusp is an irregularly outlined, dark green, depressed, circular ulceration with rounded edges measuring 1.7 cm. in diameter. This ulceration is seen to communicate with and to the base of the vegetation upon the mitral valve. Coronary arteries are not sclerosed.

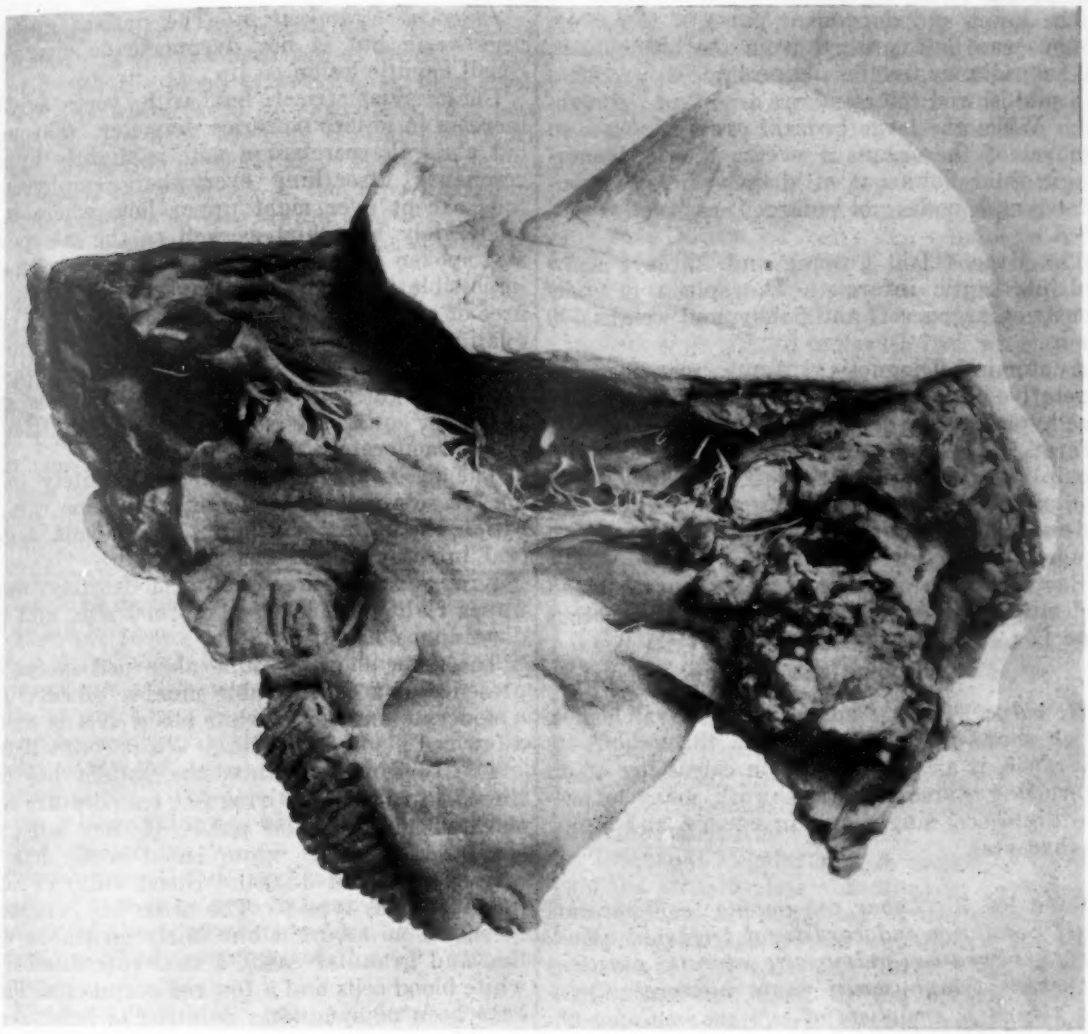


FIG. 4. Case 3. T. J. McC. Photograph showing the tricuspid valve practically occluded by a large, friable, nodular mass of vegetations extending along the entire base of one cusp.

Measurements: Tricuspid valve 9.7 cm., pulmonary valve 7.6 cm., mitral valve 8.6 cm., aortic valve 7.8 cm., left ventricle 1.4 cm., right ventricle 0.4 cm.

Lungs: The lower lobes of both lungs and the middle lobe of the right lung are firm, noncrepitant, soggy and of a deep, dark red color. On section the cut surfaces ooze much bloody serum and the congestion of the lobes, while diffuse and generalized, is seen to be more marked in the lower and dependent parts of the lobes. No pus can be expressed from the bronchioles. All interlobular fissures obliterated. Upper lobes of a pinkish red color and are crepitant throughout. When the large bronchi are cut across in removal of the organs a stream of sero-hemorrhagic fluid flows out of their orifices. Bronchial lymph nodes not enlarged, caseous or calcified.

The liver (2050 grams) and kidneys show multiple septic infarcts. The spleen is enormously enlarged, soft and flabby, and weighs 600 grams.

Anatomical Diagnosis: Acute pneumococcus vegetative endocarditis of the mitral valve; cardiac hypertrophy; septic infarcts of liver; septic infarcts of kidneys; acute splenic tumor, (toxic); fibrinous pleuritis, left; fibrinous purulent pleuritis, right; pulmonary congestion and oedema; septicaemia; congenital malformation of aortic valve.

Bacteriology: Cultures from heart's blood and mitral valve vegetation show pneumococcus type I.

MICROSCOPIC EXAMINATION

M. valve. Closely adherent to mitral leaflet, which shows acute inflammation throughout its substance, is a large vegetation consisting of an interlacing coarse fibrin meshwork, many lanceolate diplococci singly and in masses, and a few erythrocytes.

CASE No. 3. *Lobar pneumonia: septicaemia: acute vegetative endocarditis of tricuspid valve: early pericarditis: pulmonary infarcts: purulent bronchitis: emphysema: acute bilateral fibrinous pleuritis: embolism of left eye: miliary abscesses of the kidney: chronic passive congestion of liver: arteriosclerosis. Sputum, blood culture, vegetations from the tricuspid valve, and heart's blood post-mortem, all show pneumococcus type I.*

T. J. McC.—Hospital No. 416,715.

Man of 51, admitted April 3, 1921.

Family History and Past History—unimportant.

Present Illness—Sudden onset 21 days before admission, but no clear history of symptoms given. Evident that they were those of a severe respiratory infection. The patient's family physician reports that he had typical signs of lobar pneumonia in the right upper lobe. He has had severe cough with abundant sputum, which at first was rusty and tenacious. For the first two weeks it is reported that he had continuous delirium and that he ran a temperature of approximately 103°. It fell by crisis 7 days ago and remained normal for 3 days. Since then he has had constant, irregular temperature and chills every afternoon lasting approximately one-half hour. There have been no gastrointestinal symptoms.

Physical Examination—The patient appears very weak but is not dyspnoeic or cyanosed. Small hepatic lesion on lip.

Chest symmetrical but with very evident increase in antero-posterior diameter. Throughout chest the percussion note is slightly hyperresonant. Breathing everywhere emphysematous except over right upper lobe where it is moderately bronchial as well as the whispered and spoken voice. No rales. Borders of heart impossible to make out because of the high degree of emphysema. Sounds distant and of poor quality, action regular, rate 130. No murmurs heard. Second sounds at the base not increased, but A_2 slightly greater than P_2. Pulses synchronous, equal, fair volume and tension. Radial artery moderately stiff and tortuous.

The present condition seems definitely to be one of resolving pneumonia with some complication, the nature of which is not evident. A general infection seems most probable.

Xray examination shows moderately dense upper right lobe, heart of normal size, and mediastinum normal.

The urine shows nothing abnormal except the presence of a considerable number of casts and a moderate number of white blood cells as well as a few red blood corpuscles. White count 15,000.

4-8-21—Since entrance, the patient has continued to run a very irregular temperature with elevated and irregular pulse. He has had occasional chills. The white blood count has remained at about 15,000. Blood cultures show pneumococcus type I. The urine has persistently shown no albumin but fairly enormous hyaline and granular casts, a moderate number of white blood cells and a few red corpuscles. There have been no symptoms pointing to infection in the kidney. The signs in the heart are as at entrance.

4-20-21—The patient's condition has gradually become worse. The persistent positive blood cultures indicate a pneumococcus septicaemia, but so far there is no evidence of focal infection. During the past 3 days the patient has had a definite chill each afternoon, and on one occasion, twice during the night. By a process of exclusion it seems probable that a pneumococcus endocarditis exists although there are no signs in the heart to suggest it.

4-23-21—Yesterday, patient suddenly complained of very acute pain in the left side of the chest which was accompanied by intense dyspnoea and later followed by the raising of bloody

sputum. This morning there is a definite friction rub heard throughout the left axilla, and at the base, posteriorly, there is a considerable area of dullness with slightly diminished respiration, and very numerous crackling rales. These signs indicate pulmonary embolism. This complication is interpreted as added evidence of a focus in the endocardium.

5-2-21—Last night the patient complained of very sudden blurring of vision in the left eye, and today vision is completely lost. In addition to this there is some thickness of speech. Since April 18th the blood cultures have been negative. The white count has gradually increased to 44,000. The urine has been normal since April 8th. Wassermann negative. The sputum has not shown the presence of the type I pneumococcus presumably due to the fact that the patient was admitted 3 weeks after the onset of the pneumonia.

5-5-21—During the past few days the dyspnoea has increased, and cyanosis has been quite marked. The heart sounds have been almost inaudible for some days, the heart action very rapid, and somewhat irregular, otherwise the heart signs are as at entrance. Type I antipneumococcic serum has been given intravenously in full doses without obvious effect on the cause of the disease. The patient died at 1:30 P. M.

Autopsy, No. 21-70. May 6, 1921. (Summary of positive findings.)

The left pleural cavity contains 500 c.c. of blood tinged fluid, the blood probably being due to operative procedure during removal of sternum at autopsy. Numerous fine friable adhesions throughout right pleural cavity. The left cavity shows throughout a generalized roughening by fibrin. The left lower lobe posteriorly shows a large infarcted area.

The precordial cavity contains 30 c.c. of brownish colored fluid and small flakes of white fibrin. There is an area 3x1 cm. on the anterior surface of the epicardium which shows a thin, white, veil-like covering of loosely attached fibrin.

The heart weighs 325 gms. Moderate increase in sub-epicardial fat. The tricuspid orifice is practically occluded by a large, yellowish-white, friable, nodular vegetation, extending along the entire base of one cusp. There are several smaller B-B shot vegetations. Together these vegetations form a mass about 3x3x1.7 cm. in measurements. It approximates the opposite heart wall. The right ventricle is lined with a non-adherent layer of red blood clot about .4 cm. thick and this cavity is much narrowed in diameter. There is no evidence of ulceration about the bases of the vegetations. Other valves negative. Coronary walls moderately sclerosed. Myocardium negative.

Measurements: Tricuspid valve 12.0 cm., pulmonary valve 7.1 cm., mitral valve 9.0 cm., aortic valve 6.2 cm., left ventricle 1.7 cm., right ventricle .3- .4 cm.

Lungs: Except for pleuritis on the left, the two upper lobes seem quite negative. The lower left lobe is a dark brownish-red color, non-crepitant, sinks when placed in water. There is a very hard mass in the latero-posterior portion which bulges and is covered by an exudative pleuritis. This lobe cuts with a firm resistance. The hard nodule comprises about one-third of the lobe, is roughly triangular in shape, its base being the bulging surface of the lung. At the apex of this pyramid lies the pulmonary vessel, which is plugged by an embolus with blood-clot extending for several mms. on each side of the embolus. The triangular area is a very dark red color throughout, dry and very hard; several small soft, yellowish-green purulent foci are seen in the infarct. The remainder of the lobe is markedly congested and the bronchi contain a purulent exudate. The right lower and middle lobes are moist, red, crepitate poorly and contain several hard brownish foci, which on section are dry; however, no emboli are evident in the vessels.

Anatomical Diagnoses: Acute vegetative pneumococcic endocarditis, tricuspid valve; pulmonary embolus with infarcts; purulent bronchitis; congestion of lungs, bilateral, lower lobes; acute fibrinous pleuritis with effusion, left; acute fibrinous pleuritis, right; beginning pericarditis: chronic passive congestion of liver; arteriosclerosis; miliary abscesses of kidney.

Bacteriology: Cultures from heart's blood show pneumococcus type I.

MICROSCOPIC EXAMINATION

Heart: Numerous small foci of lymphocytic cells between muscle bundles and occasionally polymorphonuclear leucocytes scattered throughout the interstitial substance.

Tricuspid Vegetation: A mass of pink homogenous structureless substance in center, while the borders are composed of definitely staining polymorphonuclear and endothelial leucocytes, masses of diplococci and fibrin. The masses of organisms are dead in the center, half way toward the periphery the greater part of vegetation is living organisms. These diplococci are gram positive.

CASE NO. 4. *Lobar pneumonia, right upper and middle lobes: septicaemia: acute vegetative endocarditis, aortic valve: syphilitic aortitis: aneurysm of the aorta: severe anemia: old healed pleuritis and perisplenitis: multiple cysts of both kidneys. Sputum and blood cultures show pneumococcus type I: direct examination of a small portion of the aortic valve vegetations showed scattered pneumococcic.*

T. S. W. Hospital No. 417,917.
Colored man of 34, admitted April 29, 1921.
Family History and *Past History* unimpor-

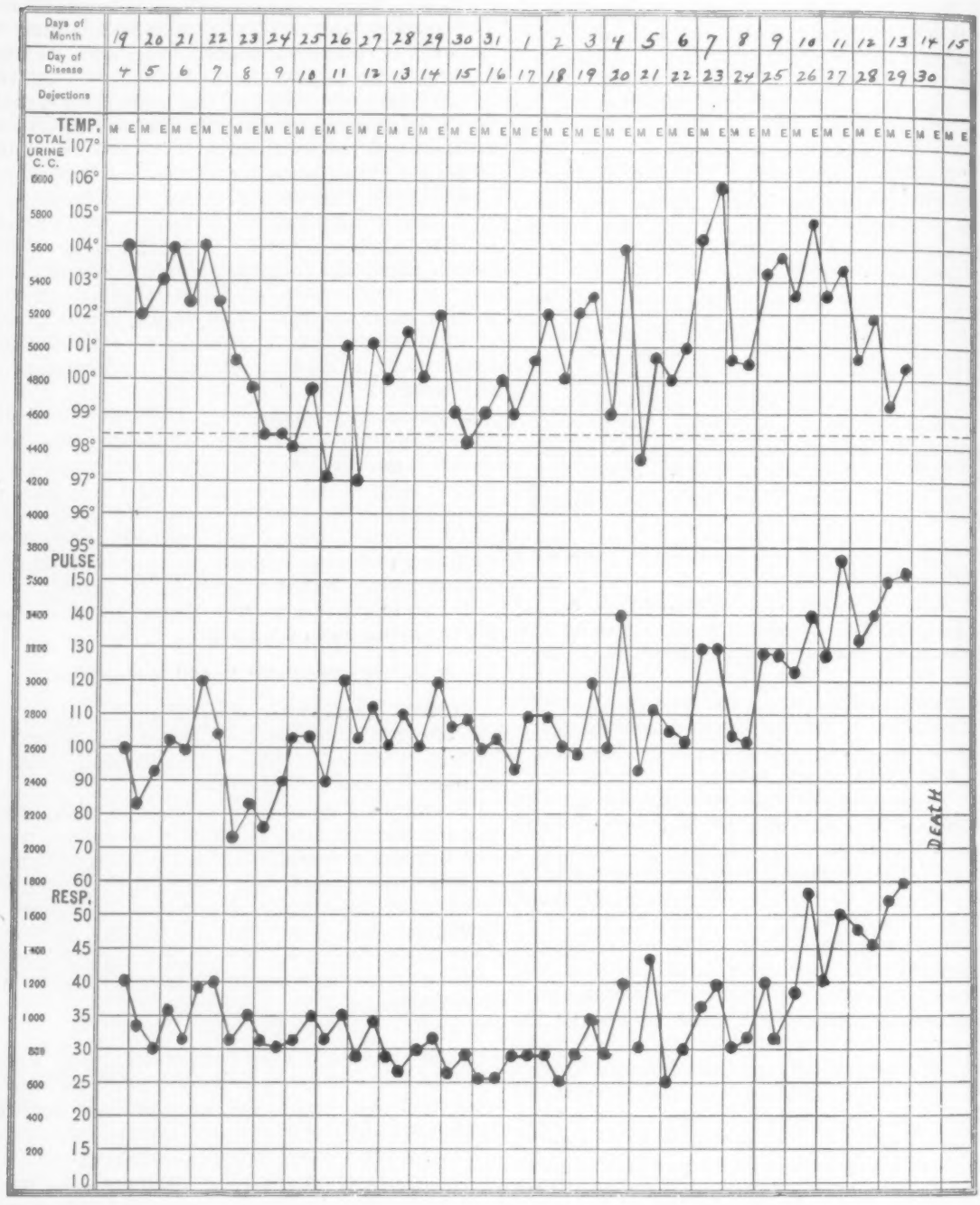
tant except for moderately severe attack of influenza in 1918.

Present Illness—Sudden onset 8 days ago with malaise, prostration, and fever, but no chill. On the following day severe, unproductive cough. A day or two later brownish, rusty sputum. Patient has apparently had a continuous high fever.

Physical Examination—Patient appeared very sick, but no cyanosis or dyspnoea. The sclerae show quite marked jaundice.

The chest is symmetrical, but expansion on the right is less than on the left. Moderate dullness in the right front from the second space, downward, extending laterally well into the axilla. The respiration and vocal fremitus are bronchial in type but rather distant. Over this same

CASE NO. 1



10M.-4-'22

area are numerous crepitant and subcrepitant rales.

Heart impulse felt in the 5th space, 9 cm. to the left of mid-sternal line, which corresponds to the outward limits of percussion. Right border at right sternal edge. No thrill. Heart action rapid but regular, and sounds clear. No murmurs heard.

Pulses synchronous, equal, good volume and tension. Vessel walls not palpable.

Abdomen slightly distended. Quite marked resistance in the epigastrium and right hypochondrium. Liver edge not felt but marked sensitiveness just under right costal border.

Urine negative. No sputum obtained.

Blood—Hgb. 75 percent; white count 46,600; red count 2,500,000; platelets 80,000. Many large oval cells and many microcytes. Serum very yellow. The diagnosis of pernicious anemia is not certain in the absence of glossitis, neurological signs and palpable spleen. The blood picture, however, is not inconsistent with primary anemia though not definitely of the Addison-Biermer type.

Blood culture—Pneumococcus Type I. Wassermann strongly positive.

Xrays confirmed the diagnosis of pneumonia of the middle lobe.

5-4-21—There are now definite signs of involvement of the right upper lobe apparently dating from a sharp rise in temperature on the 30th. There is also a marked friction rub over the right lower lobe posteriorly. The abdominal distention and jaundice are still marked.

5-17-21—Patient has continued to run some temperature, but during the past week there is a definite tendency toward normal, and he says he feels much improved. The icterus is much less marked, and the abdominal examination is negative. The sounds in the heart have remained unchanged until the past two days when a soft systolic murmur has been heard at the apex. The repeated positive blood cultures and high leucocytes (76,800 and 41,400) together with the continuance of pyrexia suggest the probability of an acute endocarditis since no other focus of infection can be found. The jaundice is less marked and the abdomen normal.

6-6-21—The temperature has continued slightly elevated, but with the pulse ranging from 80 to 90. The heart shows no enlargement. The systolic murmur has remained unchanged. In addition, however, during the past few days, a very soft diastolic whiff has been heard in the 3rd and 4th interspaces to the left of the sternum. Blood cultures continue to be positive for pneumococcus type I. Repeated Wassermann tests positive but slightly anticomplementary. Leucocyte count 19,600. The urine has continued negative except for the presence of many hyaline and fine granular casts.

6-9-21—The patient's general condition seems surprisingly good, and the signs of the pneumonia have gradually disappeared. Suddenly about 11 A. M. the patient had extreme respiratory distress, became cyanosed, and died almost immediately.

Autopsy, No. 21-96. June 14, 1921. (Summary of positive findings.)

Left pleural cavity contains a few old adhesions posteriorly. The right cavity obliterated in its upper half by firm fibrous adhesions. No fluid in either cavity.

The pericardial cavity contains about 20 c.c. of clear, straw-colored fluid. Surface smooth and glistening. Heart weighs 375 grams. The muscle of firm consistency, and dark red color. Epicardium and myocardium normal. On the left anterior leaflet of the aortic valve, and near the edge, is a round, firm, granular, gray thrombus 7 cm. in diameter. The free edges at the adjacent angle of the right and left cusps are adhered by rather firm fibrous adhesion; above the right anterior leaflet there is a slight aneurysm of the sinus of Valsalva 1.2 cm. in diameter and .5 cm. in depth. Direct microscopic examination of the vegetations shows scattered pneumococci. Other valves normal. Coronary arteries patent and soft.

Measurements: Tricuspid valve, 12.0 cm.; pulmonary valve, 8.0 cm.; mitral valve, 10.0 cm.; aortic valve, 7.0 cm.; left ventricle, 1.5 cm.; right ventricle, 0.2 cm.

Lungs: Right upper lobe is collapsed, very firm and resistive and tightly adherent to the chest wall. On stripping out the surface is dark gray, very rough and granular. Cut surface a similar gray and yields considerable slightly sanguineous grayish exudate. Middle lobe similar. Lower lobe more yielding and not adherent. Color a reddish gray with small areas of dark gray. Cut section yields a bloody fluid. Tabs of old adhesions scattered over surface. Cut section a light reddish gray and yields a frothy pinkish exudate.

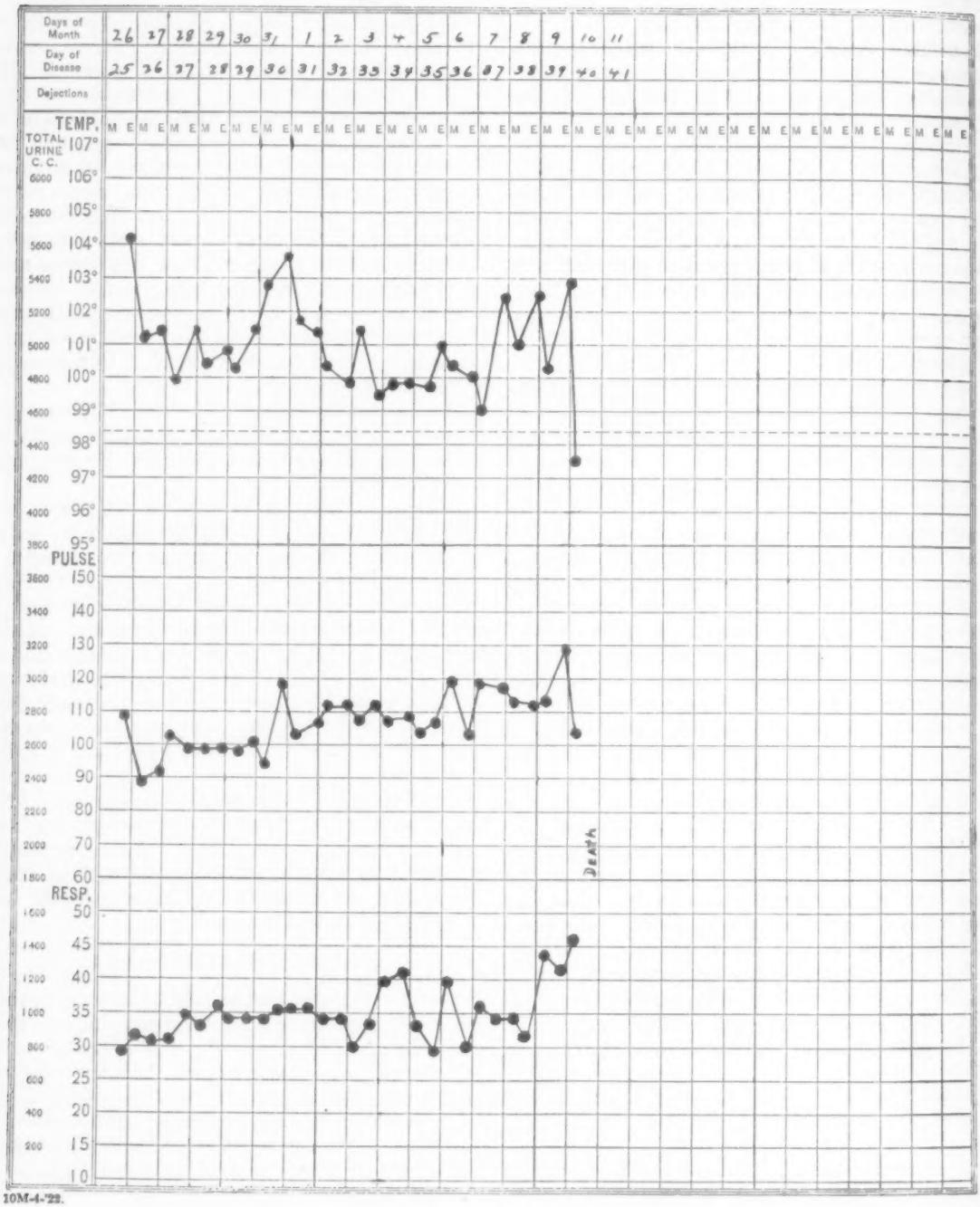
Anatomical Diagnoses: Organizing lobar pneumonia (right upper and middle lobes); old healed pleuritis (both sides); Acute vegetative endocarditis (aortic valve); aneurysm of aorta; old healed perisplenitis; multiple cysts of both kidneys; syphilitic aortitis.

MICROSCOPIC EXAMINATION

Heart: Subpericardial infiltration of plasma cells. One small area of sclerosis. Aortic valve presents two fresh thrombi, one superior to the aortic cusp and one inferior. The thrombi contain much new and some old fibrin with a profuse infiltration by polymorphonuclear leucocytes. At the base of the superior thrombus is a similar process extending upwards into the wall of the aorta for a short distance. The base of the aortic cusp is necrotic and infiltrated with polymorphonuclear leucocytes. Aortic wall above the acute process shows thickening with the intima thrown into folds. Scattered throughout the media are many large foci of lymphocytes and plasma cells with fewer endothelials and

polymorphonuclears which extend in some areas into the intima. As the necropsy was done 5 days post-mortem no cultures were obtained.

CASE NO. 2



Discussion

The literature on pneumococcus endocarditis is somewhat meagre but several comprehensive studies of the subject have been made, namely, by Netter in 1886 (Netter: *Arch. phys. norm. et path.*, 1886, VIII, 106), Wells in 1902 (Wells, E. F.: *J. Am. Med. Assoc.* 1902, XXXIX, 978), and Preble in 1904 (Preble, H. B.: *Am. Jour. of Med. Sc.*, 1904, CXXVIII, 782), the last mentioned author collecting a total of 141 cases. Unfortunately, however, in many of these and subsequently reported cases the data given is quite insufficient to prove that

the endocarditis is due to the pneumococcus. In but a small percentage of cases, in other words, has the organism been cultivated from the diseased valves. Figures of our own pathological studies, to be given later in this paper, indicate that probably at least 50 percent of the cases of endocarditis complicating pneumonia are due to other organisms than the pneumococcus, hence it is evident that the diagnosis of pneumococcus endocarditis cannot be made on the basis of such an association alone. Neither does the demonstration of the pneumococcus in the blood stream in a case of pneumonia necessarily prove that an existing acute endocarditis is of the pneumococcus type. The final test should always be the actual demonstration of pneumococci in the valve lesions. Cases should be recorded as pneumococcus endocarditis only in accordance with such an unassailable criterion. For these reasons it is obvious that only by a careful study of a large series of necropsies on pneumonia cases the essential facts regarding this condition can be obtained.

A careful examination of the autopsy reports at the Boston City Hospital back to and including the year 1900 shows a total of 537 lobar and 298 broncho-pneumonias, exclusive of the obviously terminal types. During the same period there were 150 instances of acute vegetative endocarditis, of which 30 occurred with and 120 without pneumonia.

The following discussion of this form of endocarditis is based largely on the results of the study of these fatal cases. In the very limited time assigned to this paper, only the most essential clinical and pathological features can be discussed.

1. INCIDENCE AND IMPORTANCE

Preble (loc. cit.) combines the published figures on this point to 1904 and finds a total of 11,243 cases of pneumonia with 126 instances of endocarditis, or 1.1 percent. Among 1775 autopsy cases of pneumonia, endocarditis was found in 86, or 4.28 percent. In our series of 835 fatal cases of pneumonia only 30, or 3.6 percent, showed acute endocardio lesions, and in only 14, or slightly less than 50 percent, of these 30 cases was the pneumococcus recovered from the vegetations. This means an incidence of but 1.7 percent. It seems probable that true pneumococcus endocarditis is a considerably rarer complication of pneumonia than usually supposed.

A further consideration of considerable interest is the part which the pneumococcus plays as a cause of acute endocarditis in general. The figures given in the literature range from 14 to 30 percent, but these are obviously inaccurate since they are merely based on the occurrence of acute endocarditis as a complication of pneumonia and not on cases accurately diagnosed by cultural methods. The 14 cases of proven pneumococcus endocarditis in a total of 150 fatal cases of acute vegetative endocarditis gives a percentage of approximately nine percent due to the pneumococcus. As this applies only to fatal cases of endocarditis, it is clear that its incidence for all cases must be considerably less, since pneumococcus endocarditis is known to be almost uniformly fatal while many of those caused by other organisms recover.

2. ETIOLOGY

Among predisposing causes, sex is of but small importance although the condition is said to be more common in males than females. In our small group there were six males and eight females.

In sharp contrast to rheumatic and subacute bacterial endocarditis, this form usually occurs after adult life is reached, that is, during the fourth, fifth, and sixth decades. Eleven of our 14 cases were in this period of life. Some interesting facts on this point are given by Preble. Although 58 percent of the pneumonias in the group studied by him occurred in the first three decades of life, they comprise only 17.9 percent of the endocarditis cases, while 70.9 percent of the endocarditis cases were found in the 35 percent of the pneumonias which developed during the fourth, fifth and sixth decades.

Influence of previous disease of valves. It is usually stated that acute bacterial endocarditis almost always attacks the valves which have been previously diseased. In 25 percent of his cases, Preble found fresh vegetations on the seat of previous infections, and Menetrier (Menetrier, P.: *Bull. et. mém. Soc. méd. f. hôp. de Par.*, 1919, *3me S.* XLVIII, 679) in 22 cases of pneumococcus endocarditis noted five with acute vegetations on the scars of old lesions. This was true in only three of our 14 cases. Although it must be admitted that, as is true of bacterial endocarditis generally, pneumococcus does sometimes attack the valve which has previously been injured by an infectious process, any definite relation to an antecedent rheumatic infection is doubtful.

Types of Pneumococci. Some years ago, Thomas and O'Hara (*J. H. Hosp. Bull.*, 1920, XXXI, 416) called attention to the fact that the type I pneumococcus seems to be the organism chiefly concerned in the cases under discussion. Palmer (Palmer, W. W.: *Med. Clin. N. Am.*, 1919, II, 4, 987) reports two,* and Bloomfield (Bloomfield, A.: *J. H. Hosp. Bull.*, 1917, XXVIII, 306) a single case of endocarditis due to the type I pneumococcus. The four cases reported above were all the result of invasion by the type I pneumococcus. Clough (Clough, M. C.: *J. H. Hosp. Bull.*, 1917, XXVIII, 306) on the other hand records two cases, one due to type III and one to type IV pneumococcus.

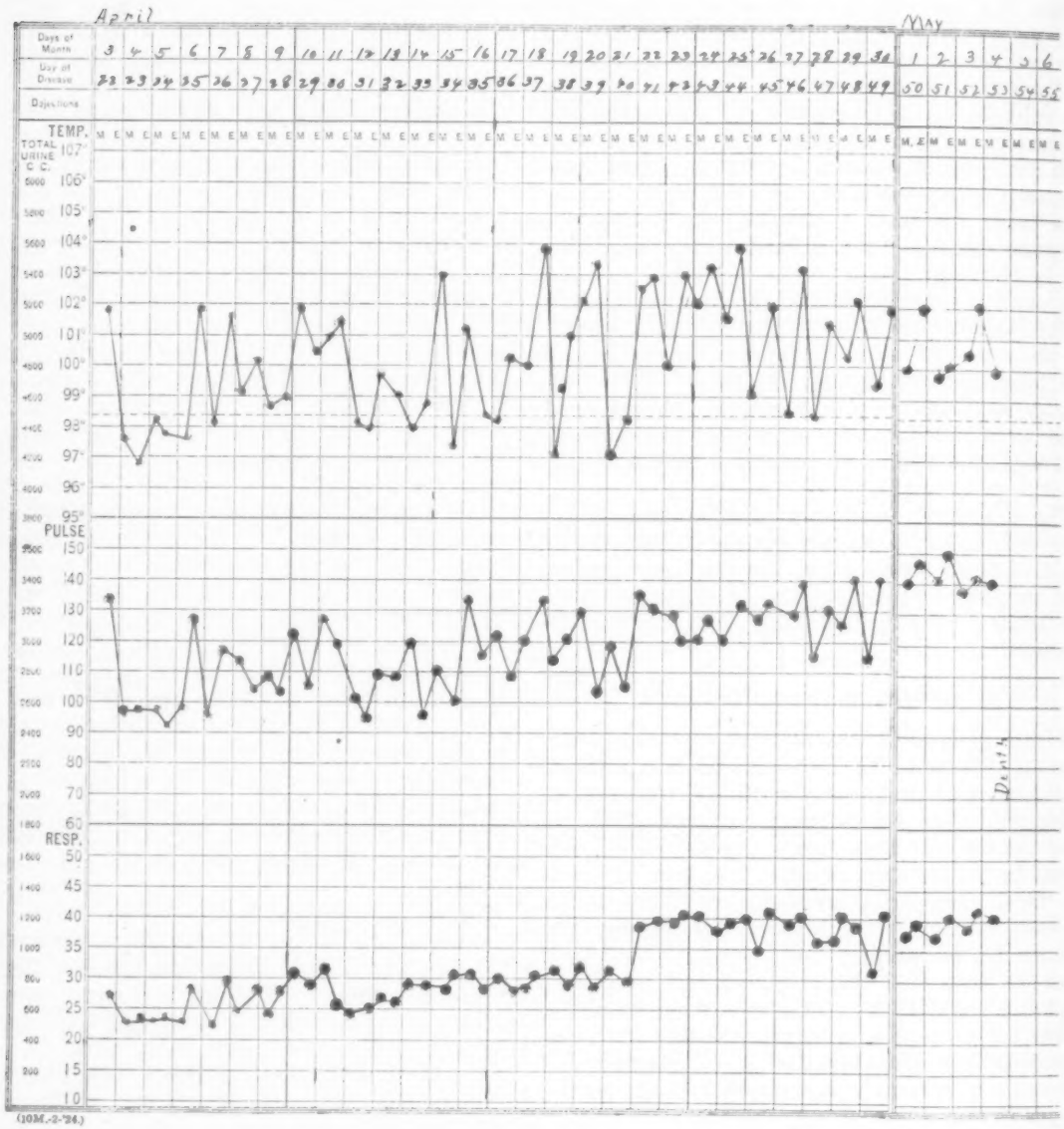
*The diagnosis in one of these cases may reasonably be questioned inasmuch as the patient recovered and the only evidence that the endocarditis was of pneumococcus origin was the positive blood culture.

Seven of the nine cases on record, therefore, where definite typing of the pneumococcus was done, were caused by the type I organism. Wadsworth (Wadsworth, A. B.: *Jour. Med. Research,* 1918-19, XXXIX, 279) gives quite similar figures for pneumococcus endocarditis developing in horses while being immunized against the pneumococcus. In seven of the eight animals autopsied an acute pneumococcus endocarditis was found: type I in five, type II in one, and type III in one. As emphasized by Thomas and O'Hara, these findings are in accord with the recognized fact that the type I pneumococcus is particularly prone to cause focal infections. It seems a fair assumption that this type is chiefly concerned in producing pneumococcus endocarditis.

3. PATHOLOGY

In certain respects pneumococcus endocarditis differs quite strikingly from the other forms of acute bacterial endocarditis.

CASE NO. 3.



A. Cardiac Lesions

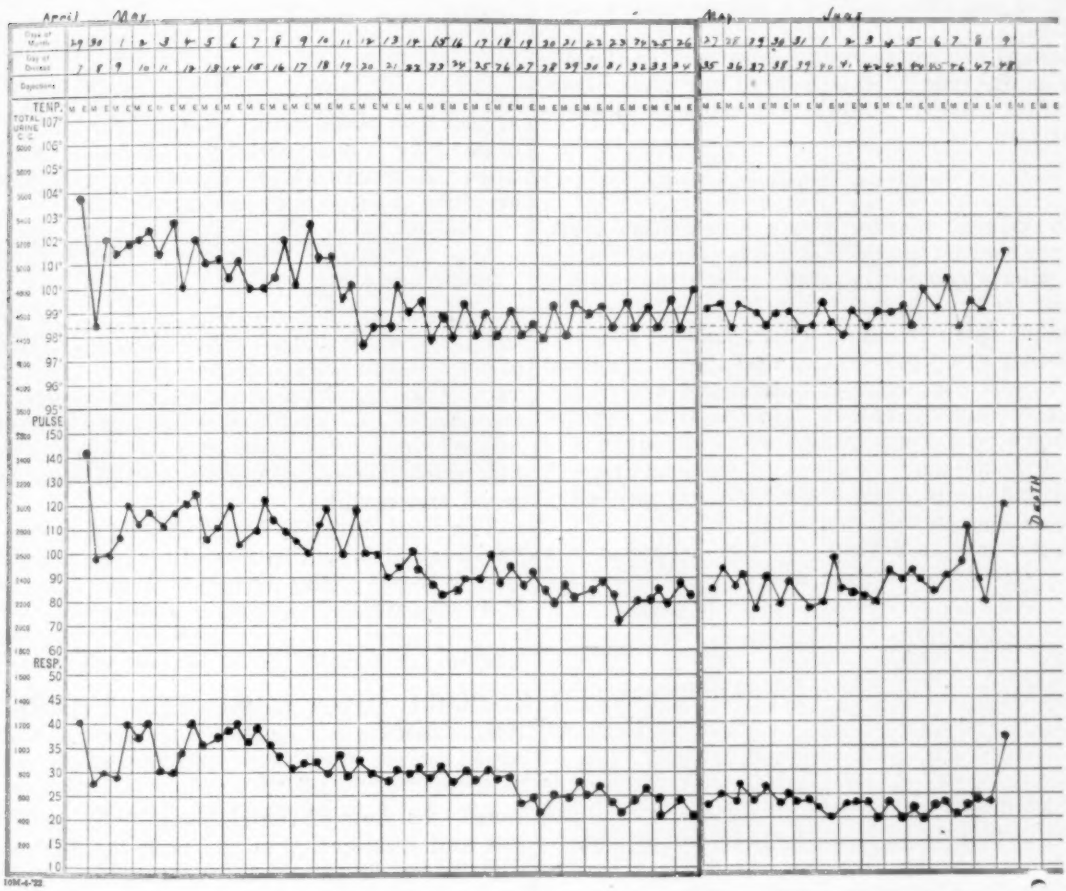
Pericardium. The great frequency of pericardial involvement in this condition has often been emphasized, thus contrasting sharply with rheumatic and sub-acute bacterial forms in which such an association is much less common. Fifty percent of our cases of pneumococcus endocardi-

tis showed an accompanying involvement of the pericardium as follows: purulent pericardium, four; complete obliteration of the pericardium, one; fibrinous pericardium, one; and hydropericardium, one.

Myocardium. Gross and severe myocardial changes are noted with relative infrequency. Only two of our 14 cases showed such gross alterations. The mural endocardium is occasionally involved. Moderate to rather marked hypertrophy of the heart muscle is commonly found, although clinically the heart is seldom rare and there seems to be but little tendency to cicatricial contractions. The vegetations vary from minute gray to red granulations along the line of closure of the valve leaflets to relatively enormous verrucous cauliflower-like outgrowths, as is so well illustrated in Case 2. On the whole, the valve exudate is apt to be massive. The tendency to healing does not seem characteristic of pneumococcus endocarditis.

As in all forms of endocarditis the valves of the left side of the heart are more commonly attacked than the right but the latter are relative-

CASE NO. 4.



noted as definitely enlarged. Exclusive of the two cases with chronic endocarditis, the heart in five of our cases weighed over 300 grams and two of these over 400 grams (310, 375, 405, 410, and 340 grams respectively). The coronary arteries seldom show any involvement.

Endocardium. The valvular lesions are usually those of the vegetative (proliferative) type and on the whole show less tendency to ulceration and destruction of the valve cusps than in endocarditis due to the streptococcus or the staphylococcus. Necroses and perforation are ly much more frequently involved in pneumococcic than other forms of endocarditis. From his study of the collected cases from the literature, Preble concludes that notwithstanding the fact that pneumococcus endocarditis is more often left than right, the valves of the right heart are four times as frequently the seat of lesions as in other forms of endocarditis, and as regards the valves of the left heart, the aortic more often than the mitral. The most striking difference is the enormous relative frequency with which endocarditis of the tricuspid valve is found; 20

times as often, according to Preble. The valves involved in our cases are as follows: Mitral 9, tricuspid 5, aortic 4.

B. Extra Cardial Lesions

Passive congestion of internal organs and exudates in serous cavities are common as in the case of all chronic cardiac affections with decompensation.

Focal infections in internal organs and serous cavities, and especially the meninges, are the most characteristic findings in pneumococcus endocarditis. In fact, nearly all cases show focal sepsis somewhere and death is often due to such complications. From a study of 63 cases, Netter found that 71.4 percent died of meningitis. Four of our cases showed a pneumococcus meningitis.

Emboli are common and especially in the viscera as was true in 50 percent of our cases. Suppuration usually follows. Thrombosis is somewhat rare.

4. CLINICAL CHARACTERISTICS

The clinical picture is as a rule neither striking nor characteristic. Like other forms of acute and subacute bacterial endocarditis the onset is almost always insidious. It is frequently the continuance of an irregular fever, marked leukocytosis and symptoms of toxaemia not explained by obvious and usual complications which suggest the diagnosis rather than any local signs in the heart. In many instances the appearance of emboli is the first evidence of endocarditis. A persistent bacteriemia should always suggest a possible endocardial complication.

In general the symptoms when present are those common to endocarditis due to any organism. With the subsidence of the pneumonia the temperature often falls as normally and for some days the patient may remain afebrile. Shortly, however, the temperature rises and throughout the disease runs an irregular intermittent course. Considerable periods of remission sometimes occur and cases are said rarely to run an afebrile course. The pulse is variable but usually much elevated and with a gradually increasing rate as the disease progresses. Chills and sweats are common. Cyanosis and dyspnoea are marked symptoms in most cases especially in the late stages of the disease. As a rule the evidence of toxaemia is striking. A moderate secondary anaemia and an intense leukocytosis are usually present.

Subjective heart symptoms are very seldom prominent and in a surprisingly large percentage of cases, cardiac signs are entirely absent. The size of the heart does not significantly change. A systolic murmur should be disregarded unless it becomes very prominent. The appearance of a definite diastolic murmur on the other hand almost certainly means an endocarditis. A precordial rub also is an important evidence of infection of the heart.

5. COURSE AND DURATION

A very few cases of pneumococcus endocarditis with recovery have been recorded but proof that such cases have a pneumococcus infection of the endocardium is impossible. Certainly the vast majority follow a uniformly progressive course and the condition should be regarded as of malignant type. Short remissions do occur but much less commonly than in subacute bacterial endocarditis.

The total duration of the disease is somewhat variable but is seldom more than a comparatively few weeks. The extremes in our cases were 12 to 98 days and the average 41 days.

SARCOMA OF THE NOSE, WITH REPORT OF A CASE TEN YEARS AFTER OPERATION

BY G. A. MOORE, M. D.; F. A. C. S., BROCKTON, MASS

MALIGNANCY of the nose, the accessory sinuses or the naso-pharynx is of rare occurrence. J. A. Watson (cited by Higgins), in 1904, after reviewing the literature for the past 150 years, found only 150 cases, all of these were sarcomas. Clark, in reporting a case of sarcoma of the nose in 1916, stated that there had been 20 cases in the Massachusetts General Hospital since 1896.

Of the malignant growths involving the nose and accessory sinuses sarcoma occurs most frequently. The round cell type is of most frequent occurrence, the fibro-sarcoma next in frequency. The fifth decade in life is the one in which most cases occur, although a few cases in children have been reported. Unlike sarcoma in other parts of the body, growth in the nose is extremely slow and metastases are of rare occurrence. In view of the rich supply of blood vessels and lymphatics in the nose these facts are difficult of explanation. Clark stated that he could find but two cases in the literature which with his own made three cases of true metastases following sarcoma of the nose.

It may arise from the floor of the nose, within the septum or from any part of the nose. The antrum is more frequently involved than the other accessory sinuses. Limitation of the growth to the cartilaginous portion or end of the nose has been noted in but one other case (Bond's reported by Parke & Colledge), than the one here reported.

On account of the sinus involvement operative procedures of necessity are directed toward them, and because of the inaccessibility of the

growths complete removal at operation is hardly to be expected.

The gratifying results obtained in the past from operative treatment of sarcoma within the accessory sinuses of the nose are a credit to the surgical technic of rhinologists.

The use of radium in recent years in these

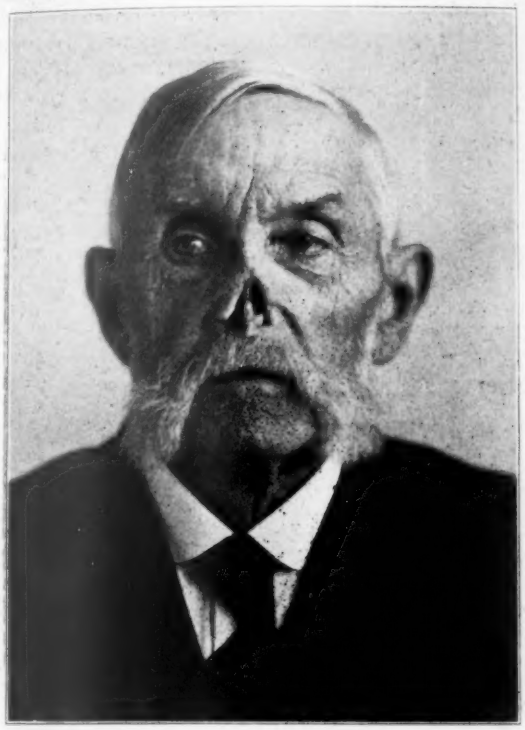


FIG. I. View of patient ten years after operation.

conditions bids fair to be a material aid in lowering the mortality as well as avoiding many hazardous operations.

The following case is of interest for several reasons:

1. The unusual situation of the growth. Only one other case has been found in the literature limited to the cartilaginous portion of nose. Bond's case mentioned by Parke & Colledge.
2. The problem in differential diagnosis between sarcoma, inflammation and rhinophyma.
3. The apparent complete freedom from extension or metastases ten years after removal of the growth.
4. The radical method of treatment, which so far as I am able to find in a review of the literature is the only case of sarcoma of the nose treated by amputation. The condition here reported is apparently so rare that no mention of it is made in any text books except the one already noted. Neither is mention made of it as simulating rhinophyma.

CASE REPORT

Mr. S. M. H., Brockton, Mass. Age 70.
Referred by Dr. A. E. Paine, Brockton, Mass.
August 26, 1913.

P. H. About fifteen years ago hit in the right eye by a falling splinter of a board causing injury which necessitated removal of the eye. About five years ago fell from a staging, landing on his face and "breaking his nose," since then nose has been deflected far toward the right. Patient states that nose was sore for a few weeks after the accident, but after that it was quite normal except that it was pushed over to the right. Has never had any pimples or boils on the end or within the nose. About three years ago first noticed a slight bulging of the end of the nose on the left side, which increased in size very slowly. There was no soreness of the nose or discharge. About two years ago was hit on the end of the nose by a board, causing tem-

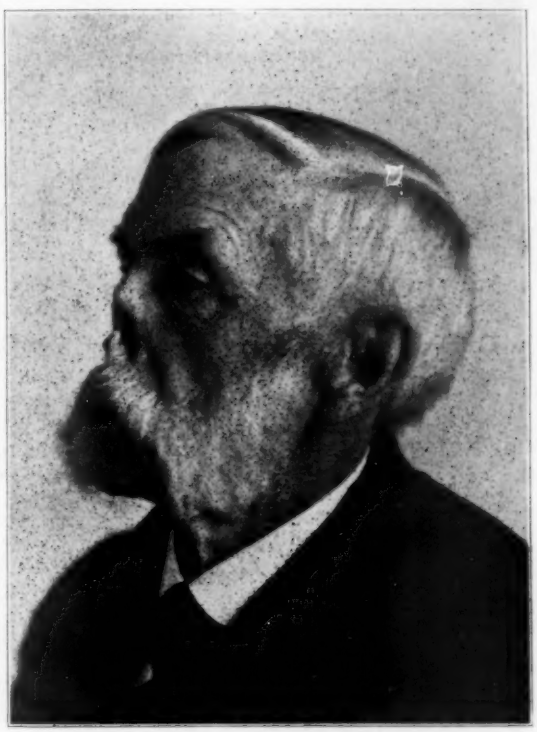


FIG. II. View of patient ten years after operation.

porary pain and soreness which soon passed away. During the winter of 1912-13 noticed that the mass was increasing somewhat more rapidly in size, that it was becoming slightly red and that small capillaries were making their appearance in the skin over the mass. On account of the increase in size of the nose he became alarmed and consulted his doctor.

P. E. Well developed, fairly nourished. Right eye artificial, left eye normal. Teeth false, throat normal. Nose: the left side of the end of the nose is reddened and swollen, the

skin over this area contains many dilated capillaries. On palpation, the swelling is very firm and resistant, does not pit on pressure and is not tender. There is moderate bulging within the external nares. The mass measures 2.6x2.9x1.5 centimeters. The mucous membrane of the left nares is normal as are also the turbinates and septum, except that the septum is deflected far to the right. There is no involvement of the upper lip and no glands palpable in the neck. Heart and lungs normal. Abdomen level, tympanitic, no masses. Blood Pressure 160-70. Urine normal.

The patient was referred to a competent dermatologist in Boston, who stated that the mass was doubless inflammatory in origin from pimples within the nose. He advised treatment to reduce the inflammation. Ichthyol Ointment 40% was then used for a month, during which time the nose seemed to increase in size and become redder. This method of treatment was then abandoned and he was advised to try X-Ray treatments. He continued these treatments at irregular intervals for six months. During this time there was no appreciable enlargement externally of the nose.

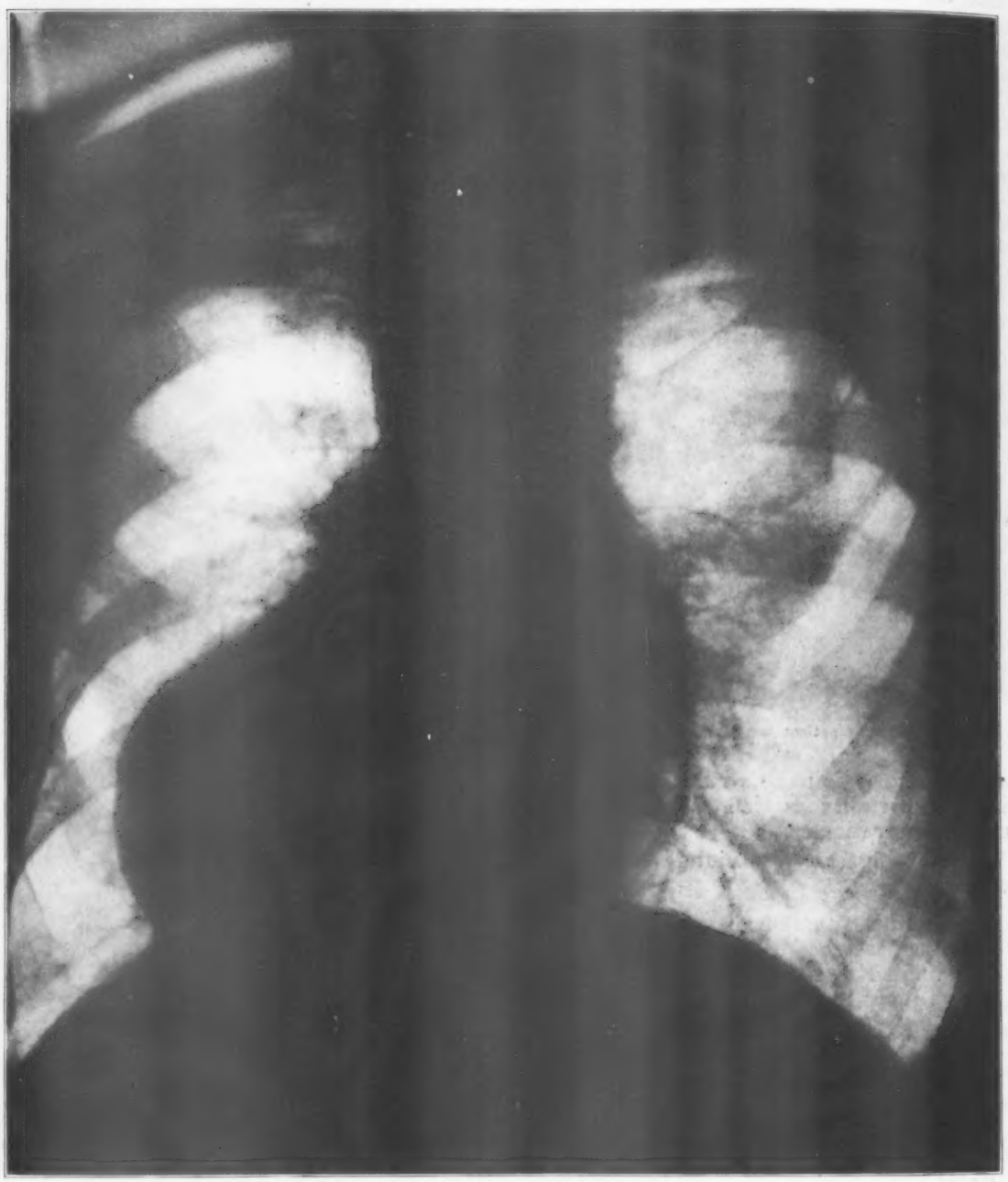


FIG. III. X-ray of patient's chest ten years after operation.

but the mass seemed to be larger within the nares. At this time it was noted that the skin over the apex of the tumor was red and smooth, but about its base the skin was rather thickened and brawny and the sebaceous glands were dilated and depressed. A diagnosis of rhinophyma had been made, but in view of the fact that the tumor was increasing in size within the nose it seemed advisable to remove a specimen for examination.

March 22, 1914, a small specimen was removed from the apex of the tumor and sent to Dr. F. B. Mallory of the Boston City Hospital, whose report follows:

"S14-576 Diagnosis: Fibrosarcoma (rapidly growing)
Material: Tissue from the nose. Date: 3/24/14.
Name: S. M. H. 70. Service Dr. Moore. F.
History: Gradual increase in size of end of nose, moderate redness.
Gross: Specimen consists of small speck of pale white tissue.
Mx. Examination shows bundles of spindle shaped cells running in various directions. Mitotic figures very numerous."

March 28, 1914. Operation: Under ether anaesthesia I removed the cartilaginous portion of the nose together with a portion of the bony septum. The entire left ala was removed but a portion of the right ala was left in the hope that it would aid in holding an artificial nose in position.

The specimen removed at operation was submitted to Dr. Mallory for examination. The following is his report:

"S14-629. Diagnosis: Fibrosarcoma (rapidly growing)."

The second specimen consists of the end of nose with a firm nodule on the inner surface of the left nostril. The microscopic examination shows the tumor invading and perforating the cartilage.

I wish to take the liberty here to state that the specimen removed at operation was submitted to Dr. Mallory for study of the structures composing the edge of the mass to ascertain if any of the tumor had been cut through. This was done by Dr. Mallory, who stated that the edges of the specimen were normal tissue.

Amputation of the nose is an operation of such rarity that very few text books mention it. It was apparently more often used in barbarous times as a measure of torture than since the days of aseptic surgery. It may be of interest to state that my technic in preserving a portion of the right ala for holding an artificial nose in position has been a source of considerable criticism on the part of the patient and is unsatisfactory from an esthetic point of view. The stump of ala promptly curled inward within the nares and has irritated the anterior end of the turbinates as well as interferred with cleansing the nose. A complete removal of the right ala would have been more satisfactory.

At frequent intervals since operation the patient has returned for examination, the last examination being made in November, 1923. The wound edges were normal, both nares normal. No abnormality of hard or soft palate. Throat normal, no glands palpable in submental or cervical regions. No loss of weight. Blood Pressure 180-90. Heart moderately enlarged, sounds irregular with systolic murmur. Lungs clear and resonant, no rales. Abdomen level, no palpable masses. X-Rays of chest show no metastases in the lungs.

While the method of treatment was radical the result viewed from an observation period of over ten years has thus far fulfilled the most exacting requirement of the surgery of cancer, a total extirpation of the growth.

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CONNECTICUT MORTALITY STATISTICS: 1923

Washington, D. C., November 5, 1924.

THE Department of Commerce announces that the 1923 death rate for Connecticut was 1,201 per 100,000 population as compared with 1,203 in 1922. This small decrease in 1923 is accounted for by decreases in the death rates from cancer (from 105 to 99 per 100,000 population), tuberculosis, all forms (from 94 to 90 per 100,000 population), and diarrhea and enteritis, under 2 years (from 30 to 23).

Increases in 1923 are shown in the death rates from whooping-cough (from 6 in 1922 to 9 per 100,000 population), and measles (from 8 to 11).
—*Department of Commerce, Washington.*

PNEUMOTHORAX THERAPY IN TUBERCULOSIS

BY W. A. GEKLER, M. D.

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ARTIFICIAL pneumothorax has won a firm foothold in our therapeutic program in tuberculosis. Although some of the earliest work in developing this method of treatment was done in America, it was only after the reports of Brauer and his pupils that the method attracted serious consideration. Balboni, Robinson, and Floyd reintroduced the method into this country with modifications in technique and apparatus which greatly simplified the procedure, both as to initial insufflation and subsequent injections. In spite of the fact that pneumothorax is used almost universally in this country by tuberculosis specialists, there is a considerable lack of unanimity as to indications, dosage, and other details in treatment. My purpose in this paper is to emphasize a number of considerations which have proven valuable to me in a considerable experience in pneumothorax work.

The type of tuberculosis which presents our most difficult therapeutic problem is phthisis pulmonalis. It is this form of tuberculosis which is responsible for the large majority of deaths caused by this disease. The prominent tissue change in pulmonary consumption is the formation of tuberculous abscesses which rupture and discharge their contents, leaving behind them cavities. While the well known hygienic, dietetic measures with particular care in carrying out the rest cure intensively have been attended with a fair degree of success in a certain percentage of cases, it is not usual for spontaneous eradication of cavities to occur. It is from these cavities that the spread of the infection takes place and until these have either been made non-productive or eradicated, the patient is not safe. It is certainly not wise or just to the patient to have him continue on the rest cure indefinitely in the hope that spontaneous obliteration will occur. We frequently find after procrastinating either that extension has taken place rendering pneumothorax therapy unwise, or adhesions have formed which make it impossible.

I should like to plead for early recognition of cavities, which means the use of every diagnostic method we have at our command, and particularly the X-ray. A recent study by B. J. Weigel, of the staff of the Albuquerque Sanatorium, of 125 patients with cavities, revealed that the majority of cavities escape detection on physical examination. In these 125 patients, 175 definite cavities were found with the X-ray; 26 of these cavities were diagnosed on physical examination, and one suspected. This means that the physical signs, which most of us have felt were indicative or typical of cavities, were absent in a relatively large percentage of these patients. They did, however, present definite X-ray evidence, coupled with persistently positive sputum. Patients raising an appreciable amount of sputum which on frequent examination invariably shows tubercle bacilli may be presumed to have cavities. A definite therapy planned to eliminate these cavities cannot be instituted until their location has been ascertained.

It is our rule, before instituting pneumothorax, to try intensive postural rest as advocated by Webb of Colorado Springs. Under this routine we find that the proportion of pneumothorax cases in our hands has dwindled to about one-fourth of what it had previously been, indicating that in three patients out of four prolonged postural rest has eradicated the cavities. By the term "eradicated," I mean that all X-ray evidence of cavities has disappeared, and in the case of single cavities, sputum which had formerly been constantly positive has been just as constantly negative, or entirely absent. It is essential, however, that this method be followed out intensively and faithfully. If we find after ninety days of postural rest that the cavity has not diminished in size, as shown by the X-ray, and confirmed by a definite decrease in the amount of sputum, we recommend pneumothorax.

Thus the patient is given an opportunity to have pneumothorax relatively early in his career, and the prospects of securing a satisfactory collapse are certainly much greater than if the treatment is delayed. It is probable, also, that under these conditions collapse need not be maintained over so long a period. While I have no statistics to present on this point, my impression is that well over fifty percent of the patients with pulmonary tuberculosis, as we see them after their arrival here in New Mexico, are at some stage in their career unilateral and thus amenable to pneumothorax therapy.

Pneumothorax therapy is distinctively a treatment for cavities. I personally feel that it is not safe to collapse parenchymatous tuberculous areas which have not broken down and discharged their contents. As a rule these areas are not situated immediately beneath the surface of the lung and ordinarily tend to rupture into a bronchus. With the compression of the lung which occurs after a collapse, they are brought much nearer the pleura and there is nothing to prevent them from rupturing and discharging into the pleural cavity, giving rise to a tuberculous empyema. Of course, it is impossible to ascertain with the stethoscope or by percussion whether a parenchymatous lesion exists capable of discharging a large mass of pus into the

pleura, and we must place our chief reliance on the X-ray for information on this point.

This brings us to the consideration of the pleuritic exudates which we have found to occur so frequently in the course of pneumothorax therapy. The reports of various authors differ on the frequency of this complication. The possibility of its occurrence exists in every patient in whom the two layers of pleura are separated by gas. If the cases are closely supervised and frequently fluoroscoped, it will be found that the majority of them at some time or other during their pneumothorax career will have developed exudate. It is generally accepted that these exudates are inflammatory in nature and due to infection of the pleura with tubercle bacilli. The separation of the two layers of the pleura facilitates the pointing into the pleura of small sub-pleural tuberculous abscesses. It is our good fortune that most of these are small and the infecting organisms few in number. It is more or less a matter of dosage of tubercle bacilli as to whether we will have a clear, so called "sterile" exudate, or a cloudy one, or frank tuberculous pus.

It has been our custom until recently to allow these tuberculous exudates to remain undisturbed because we found that after they appeared, absorption of the gas from the pleural sac was much retarded. But during the past several years, we have encountered empyema in our pneumothorax work more frequently than formerly and most of our patients who have had empyema have had a preexisting pleuritic exudate which had not been removed. We were unable to escape the impression that the presence of this exudate facilitated the development of empyema. For this reason, it is now our practice to withdraw fluid accumulating in the chest in our pneumothorax cases as soon as we are aware of its presence. As described in a recent report on "Chemotherapy in Empyema," we puncture these patients in the recumbent position, the shoulders on one table and the body on another, with a gap of about six inches between the two tables. The patient lies on the affected side with the area through which the puncture is to be made in the space between the tables; thus for the time being the axillary region is made the most dependent portion of the chest. Before the procedure is terminated, the patient is made to roll over on his back and pressure conditions adjusted by injecting enough air to replace the fluid removed. Aspirating in this way, we are able to get the pleural cavity free of fluid. We feel that if it is worth while removing the fluid at all, it is certainly worth while getting out all there is.

We frequently notice in patients in whom the fluid has been allowed to remain that the lung suddenly begins to reexpand; the presence of this fluid is beyond question responsible in many cases for the formation of adhesions between a lung which has been partially collapsed and the chest wall. In a number of cases such adhesions have apparently been the point from which reexpansion of the lung has begun and once begun, it is not always possible, even by the use of high pressure injections to stop it. We often find that this fluid will remain stationary in amount for a considerable period of time and then, for no apparent reason, either proceed to diminish quite rapidly or to increase in amount quite rapidly. By allowing it to remain undisturbed, we relinquish control of pressure conditions in the chest. We believe that pneumothorax therapy, in order to be effective, requires that the intrathoracic pressure conditions be under the control of the physician at all times, and this control not be left to chance as is the case when we allow exudates to remain in the chest for a long period of time.

There is considerable variation among the men using pneumothorax in the frequency of insufflation and the amount of air used each time. In our own experience we have found that small doses often repeated are more satisfactory than large doses at infrequent intervals. The use of large doses alters the mechanical conditions in the chest too suddenly and too markedly for the comfort of many of our patients. In giving large doses infrequently the lungs cannot help reexpanding partly during the interval, which is certainly not desirable. We compare the splint of air about the collapsed lung to a plaster cast about a broken limb, and feel that it is a mistake to allow this splint to become either too tight or too loose. Our rule is to give not more than 400 c.c. at a single injection—frequently smaller amounts are sufficient. This dosage is repeated three times a week at first and as we get the degree of collapse we desire, the intervals are lengthened to as much as three weeks. We make one exception to this rule and that is in the case where we aim to secure prompt collapse for severe hemorrhage. In some hemorrhage cases, the bleeding is so profuse that we feel justified in making a large injection, and unhesitatingly use doses as high as 1,000 c.c. It is rare, however, that conditions are urgent enough to justify such rapid collapse.

We dislike using pneumothorax in patients with heart affections. Mitral stenosis is one lesion of which we are particularly fearful, in addition, of course, to myocarditis. It has several times been our experience after collapse of the lung in the patients with valvular lesions that we have had to discontinue the compression on account of auricular fibrillation or acute decompensation.

There is also no agreement on the question of how long collapse should be maintained. Our rule, to which frequent exceptions are made, is to continue the collapse for one year after all symptoms have disappeared, particularly spu-

tum containing tubercle bacilli. After the lapse of a year with either no sputum, or negative sputum, we allow the lung to partially reexpand. If there is no sputum, we make a careful X-ray study both with the fluoroscope and stereoscopic plates. If we cannot demonstrate an open cavity or anything that is suspicious of a cavity, we allow the lung to reexpand still further, and if there is still no recurrence of positive sputum, we allow complete reexpansion to take place. During the period of reexpansion, we keep a very close watch on the patient and restrict exercise and other activities more than while complete collapse is being maintained. It is not uncommon, too, for patients to develop exudate perhaps for the first time during the reexpansion of the lung. This, of course, retards the reexpansion, but is not considered detrimental to the patient.

Pneumothorax has undoubtedly saved many lives which otherwise would have been lost, and when patients are fortunate enough to escape such annoying and dangerous complications as spontaneous pneumothorax or empyema—either tuberculous or non-tuberculous—the end results have been good. Most of the patients in whom we have employed pneumothorax are individuals who were not handling their tuberculosis well and who would otherwise have been doomed.

CONCLUSIONS

In conclusion I should like to emphasize briefly:

1st: That pulmonary consumption is a disease characterized by cavity formation; has a bad prognosis, and as a rule if not interfered with ultimately results fatally.

2nd: If pneumothorax is valuable in well advanced cases, it is certainly more valuable when properly employed early in the disease. In a unilateral cavity case without contraindication it is unjust to the patient not to employ this procedure, if several months of intensive rest have produced no definite improvement.

3rd: It is a mistake to collapse large parenchymatous lesions which have not yet broken down.

4th: Small doses frequently repeated are more logical and in practice more satisfactory than large doses at longer intervals.

5th: Fluid should not be allowed to remain in the thoracic cavity undisturbed. Aspiration should aim to completely empty the chest of fluid, and this can readily be done by the method described.

6th: X-ray study, both before and during the course of treatment, should be carried on with sufficient intensity to keep the physician informed at all times of what is transpiring in the chest. It is better to use the X-ray too often than not often enough.

ECHINOCOCCUS CYSTS

BY JOHN F. CURRAN, WORCESTER, AND

ALLEN W. LOCKE, WORCESTER

DEFINITION

The term echinococcus cyst or hydatid disease as used in medical literature refers to a parasitic affection of a human being characterized by the formation of one or more peculiarly formed cysts.

DISTRIBUTION AND INCIDENCE

This disease has a wide distribution, corresponding roughly with the distribution of the dog. It is most common in Iceland where it is epidemic, but it is also common in Silesia, Australia, Asia, British Isles, Sicily and certain parts of Europe and South America, especially in Argentina. In 1917 14% of the death-rate in Iceland was attributed to echinococcus cyst; while in Australia it was estimated 0.3% of all deaths was due to this disease. In a study of English post-mortems echinococcus cyst was determined the cause of death in 1.5% of the cases.

Next to dog countries it is found most commonly in sheep and cattle countries, probably because of the infection in the sheep, cattle and swine and the giving of their offal in abattoirs to dogs, thus completing the cycle of the parasite. In the region of Greifswald it is estimated 68% of the cattle, 51% of the sheep and 5% of the hogs are affected. In Iceland about 25% of the dogs are infected. Slaughter-house statistics in Germany show infections of 10% of cattle, 9% of sheep and 6% of hogs. On account of the slaughter-houses the disease is more prevalent in rural than urban districts. In Argentina 30% of the cattle are infected and 20% of the sheep, while in man the disease takes rank with tuberculosis and cancer in frequency.

In this country the disease has thus far been comparatively rare, but, due to the tide of immigration from Southern and Eastern Europe our immunity cannot be expected to last; and, especially in foreigners, its possibility should be remembered in all cases of obscure tumors. Bayard Holmes[1] of Chicago has reported that only one infected dog had been found in America up to 1904.

In northern Michigan, Minnesota and Mani-

toba cases have been found in immigrants who had come from Iceland. Holmes[2] reports that up to 1904 59 cases in human beings had been reported from New York, 56 from Manitoba, 24 from Pennsylvania, 13 from Maine and 9 from Ohio. 1% of the hogs were found affected at Kansas City.

Arthur Stone[3] reported 5 cases of echinococcus cyst had been operated on at the Massachusetts General Hospital from 1890 to 1902. In our own city of Worcester, Massachusetts, two cases have been noted at the City Hospital within the last three years.

ETIOLOGY

Season: Apparently unimportant.

Age: More common in adults and commonest between ages of 20 to 40. In children hydatid cyst of the liver is very rare, especially in the United States. This seems peculiar as children are particularly apt to play with dogs.

Sex: The disease is slightly more prevalent in women.

Immunity: None.

The Parasite: Usually but one species is recognized, called, technically, the ECHINOCOCCUS GRANULOSUS. This species is one of the smallest known tapeworms, having a head with 28 to 50 hooklets, a short neck and 3 to 4 segments, with a total length of 2.5 to 5mm. The last segment is the largest and the only one to mature.

FIG. 99. Tænia echinococcus. Magnified 20 diameters. (Braun.)

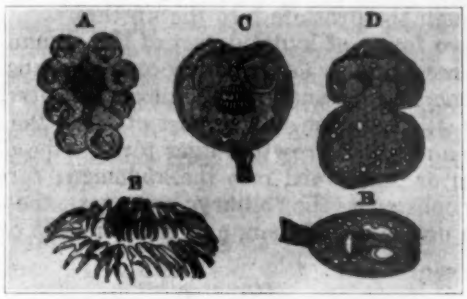
(Courtesy of Appleton Co., in Wood's Chem. and Micro. Diag., 1911.)

Distribution and Life Cycle: The normal habitat of this tapeworm when mature is in the intestinal tract of dogs, this species of animal constituting the only primary host. The dog harbors only the parent parasite and is not subject to the hydatid form which occurs in man or other animals (cattle, sheep, hogs) who are the intermediate hosts for the larval stage of the cycle.

When the terminal segment of the parent tapeworm in the dog becomes gravid it is discharged from the intestines along with the excreta. Each ripe segment is estimated to contain about 5,000 eggs which are freed on escaping with the feces. The eggs then gain access to the intermediate host through drinking water, contaminated food such as grass and raw vegetables, or by petting dogs. It is probable that they are blown by the wind in dried dust a considerable distance.

Upon arriving in the stomach of the intermediate host the rather non-resistant shell of the egg is attacked by the gastric juice and a number of 6-hooked embryos are freed. The embryos pass into the small intestine whence they bore their way to various parts of the body, especially to the liver. Usually they soon pierce a blood vessel and may then be conveyed to distant parts of the body, to form cysts. The liver capillaries are usually reached via the portal circulation. The lungs may become involved by direct inhalation or by the embryos reaching the systemic circulation from the liver and being carried thence via the heart and pulmonic circulation.

After the embryo has reached some such terminus as the liver or lungs it begins to gradually increase in size, presenting a thick, outer cuticle and an inner parenchymatous layer surrounding a cavity which contains fluid. Brood capsules arise from the parenchymatous layer and hang into the cavity and in these are formed heads. The process continues with the formation of daughter and grand-daughter cysts which fall into the cavity of the mother cyst.



Human echinococcus. (From Finlayson, after Davaine.) *A*, a group of echinococci, still adhering to the germinal membrane by their pedicles. × 40. *B*, an echinococcus with head invaginated in the body. × 107. *C*, the same compressed, showing suckers and hooks of the retracted head. *D*, echinococcus with head protruded. *E*, crown of hooks, showing the two circles. × 350.

(Courtesy of Lea Bros. & Co., in Simon's Clinical Diag., 1904.)

This combination is called endogenous echinococcus cyst formation and is the development most common in man. Such a tumor may reach a weight of 22 to 33 pounds.

To complete the life cycle of the parasite the primary host (the dog) eventually eats the infected organ of the intermediate host (e. g., liver) whereupon the embryos are freed and fasten themselves to the intestinal mucosa with their hooklets and then undergo a bisexual development with the discharge of more eggs into the excreta.

PATHOLOGY

Any part of the body may be involved but the liver is more frequently affected than all the other parts put together. Next to the liver the lungs are most frequently affected and then the kidneys. The cyst usually selects the subserous tissue of the organ it involves. Mills[4] of Chicago has reported what he believes was a primary echinococcus cyst of the heart with secondary

metastasis in the right lung. The patient, a woman 36 years old, was found dead. The right ventricle contained a hydatid cyst 5cm. in diameter with a typical laminated cyst wall but no daughter-cysts. The right lung contained four cysts, each the size of a walnut. Bird[5] of Aus-

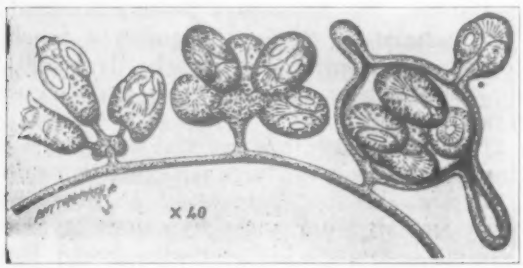


FIG. 243. Portion of the cyst wall of an echinococcus colony showing scolices (Leuckart).

(Courtesy of W. B. Saunders Co., in Keen's Surgery, Vol. I, 1906.)

tralia has reported three cases of pelvic hydatid cysts in which the daughter-cysts were extruded through the prostate into the urethra.

Two forms of hydatid cyst of the human liver are recognized: (a) echinococcus cysticus (the common one), and (b) echinococcus alveolaris (rare). The cyst occurs most often in the right lobe and in its growth bulges toward the diaphragm or downward into the abdomen; rarely it may obstruct the biliary passages, the vena cava or the portal vein, and sometimes it presses

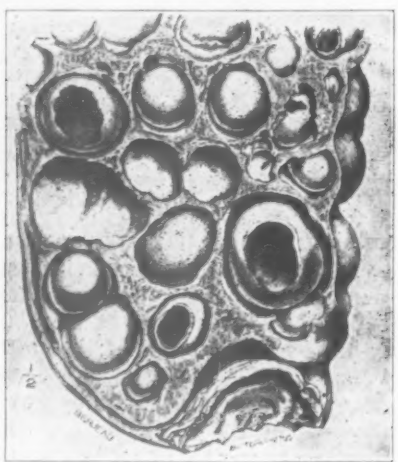


FIG. 244. Portion of a liver which weighed 25 pounds thoroughly infested with echinococcus cysts.

(Courtesy of W. B. Saunders Co., in Keen's Surgery, Vol. I, 1906.)

on the blood supply of the liver itself causing gangrene.

As a result of pressure atrophy the cyst advances in one direction or another, but especially forward. It may open into the peritoneal cavity, some viscus, the pleural cavity, the pericardium or the pelvis of the kidney. Least commonly it breaks through the skin of the abdomen.

Traumatism may result in early rupture of the cyst with death, or recovery and cure, the result.

Suppuration sometimes takes place and thus a liver abscess may be produced. There are no complications which occur in liver abscess which cannot occur in echinococcus cyst. A suppurating hydatid cyst of the liver has been reported responsible for intermittent hydrops of the gall-bladder.

PROGNOSIS

It has been stated that 50% of infections are fatal in five years. If surgical treatment be instituted before extensive metastasis has occurred a cure is the rule.

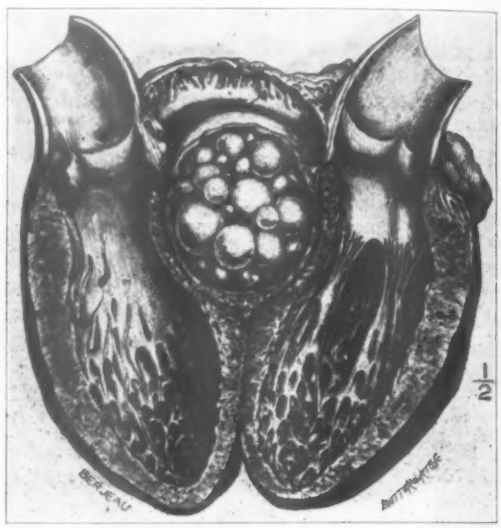


FIG. 245. A heart laid open to show an echinococcus colony in the interventricular septum.

(Courtesy of W. B. Saunders Co., in Keen's Surgery, Vol. I, 1906.)

SYMPTOMS AND SIGNS

Tumor: Frequently is the first suggestion and often is the reason for the patient consulting the physician. Cysts as large as the fist are often latent and unsuspected. The position of the cyst may sometimes be recognized by the liver bulging toward the diaphragm or downward into the abdomen. The liver as a whole is somewhat enlarged and the tumor may produce an irregularity suggestive of abscess or carcinoma. Fluid may be suspected by an elastic sensation on palpation if the tumor be deep-seated, or by a fluctuant sensation if superficial. The hydatid thrill or fremitus is not often present but is occasionally found in liver abscess.

Pain: Hydatid cyst of the liver does not in itself cause pain but there may be an inflammatory reaction with the development of adhesions which produce pain. Pain, therefore, indicates superposed infection as otherwise the parts yield painlessly to pressure. If the cyst presses upon the lumbar plexus or other nerves a gallstone

colic may be simulated. Toxins generated in the cyst may cause reflex pain.

Gastro-intestinal: Digestion is usually unimpaired but if affected it is often to but a slight extent and is due to toxic absorption of the cyst contents, to psychic influences, to interference with the biliary secretion or to movements of food in the duodenum by pressure from the cyst. There may be diarrhea, vomiting or repulsion for meat and fatty foods.

Skin: The toxic absorption may cause an urticaria.

Nervous: A psychosis may be present.

Jaundice: Occasionally shows itself in a mild form, producing clay colored stools alternating with stools stained with bile. It may be chronic.

Fever: Not a symptom unless the cyst has suppurated in which case the picture of sepsis is presented.

Laboratory Findings: There is usually a moderate leucocytosis as long as the cyst remains in the body. The eosinophiles may not be increased although they usually are if suppuration be absent. It is stated by some that eosinophilia occurs in 60-80% of the cases, whereas others state the blood examination is negative. There is a mild anemia which progresses and is increased by biliary or digestive interference.

The intradermal reaction is said to occur in 90% of the cases and the complement fixation in about 93%.

The urine is negative, although it sometimes contains albumen and casts.

General: The symptoms are chiefly due to mechanical pressure by the cyst, as fullness and weight in the region of the liver, a dragging sensation, or limitation of movement in stooping. The nutrition and strength are interfered with slightly or not at all.

DIAGNOSIS

Except in such regions as Iceland and Argentina, where it is epidemic, only a small proportion of cases of hydatid disease are diagnosed before autopsy or operation.

A history should be sought as to intimacy with dogs and if the dogs are known to be infected the diagnosis is made much more probable.

In differentiating from cancer it is important to note that in hydatid disease the nutrition is comparatively uninvolved and that the latter is most common between the ages of 20-40.

The picture of a suppurating echinococcus cyst of the liver would be identical with that of a liver abscess.

In differentiating hydatid cyst of the liver from gall-stones the shape of the enlarged liver and its anterior outline differ markedly from what is found in cholelithiasis. The liver, however, may not be enlarged.

The aspirating needle settles the question as to what the cyst contains, as the clear, transparent fluid of a hydatid cyst is pathogomonic, particularly when hooklets are found on microscopic examination. But the fluid may be cloudy or straw colored and may not contain the hooklets. The presence of hooklets alone is pathogomonic although their absence does not rule out the disease.

Hooklets from Tænia echinococcus. × 350.
(Courtesy of Lea Bros. & Co., in Simon's Clinical Diag., 1904.)

The aspirating procedure, however, is dangerous and not to be recommended as a rule because of (a) possible injury to the blood vessels and intestines, (b) the scattering of hooklets in the abdominal cavity by subsequent oozing from the cyst at the site of the puncture, and (c) poisoning such as fever, nausea, vomiting and collapse due to toxicity of the fluid and its absorption after leaking from the site of puncture.

TREATMENT

Preventive: Much can be accomplished along this line. All association with dogs, especially

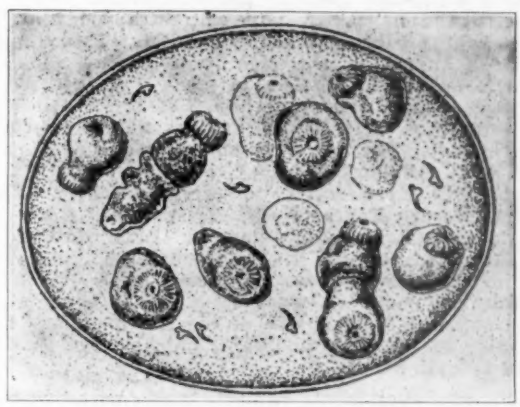


FIG. 101. Echinococcus daughter cyst removed by aspiration from a large cyst of the liver. The wall of the cyst is made up of a thin laminated membrane. Inside the cyst are numerous scolices and hooklets, the former in various stages of development. Magnified about 100 diameters.
(Courtesy of Appleton Co., in Wood's Chem. and Micro. Diag., 1911.)

imported, is accompanied by danger. Dogs should not be allowed on truck farms, or in gardens, grocery stores or kitchens. Infected dogs should be killed. In countries where the disease is epidemic the dogs should not be allowed to contaminate the pasturage of the cattle, sheep and hogs and such of these latter animals as are infected should be isolated or preferably killed. Slaughter houses should not give their

offal to dogs. All cases should be promptly reported in order to locate the source.

Curative: Medical treatment is useless. Laparotomy with opening and evacuation of the cyst should be performed. No punctures, or tappings and washings, are advisable.

Cignozzi[6] from his experience with 50 operative cases of hydatid cyst in the liver and 8 in the lungs concludes it is best to suture the cyst to the abdominal incision with capillary drainage. The cyst is packed with dry gauze for 10 days and then with gauze dipped in an acid alcohol solution. The cyst membrane shrivels and is cast off within 18-20 days. The temperature usually runs up after the 5th or 6th day from resorption but becomes normal after the membrane is cast off. The gauze stimulates granulation so that healing of the sinus is complete within 17-18 weeks. The extensive defect left can easily be corrected by a plastic operation. A plastic operation to close a large defect has been successfully accomplished in 140 of Cignozzi's cases.

The following are the reports of two cases of echinococcus cyst which entered the Worcester City Hospital:

Case 1. An Italian mill-hand, age 45, entered the Medical Service of the hospital in July, 1920, complaining of abdominal pain and swelling.

Family History. Negative.

Past History. He had never been sick in his life. He had come from Italy 20 years ago to Buenos Ayres for four years; then to New York.

Present Illness. Two weeks before admission he had a knife-like pain in the right flank radiating toward the navel. A physician strapped him for cold in his back, but without relief. Then he noticed a tumor on the right side of his abdomen which seemed to increase in size. For the last 10 days food had nauseated him, but there had been no vomiting, belching of gas or abnormal bowel movements. The last week he had been in bed. Had not been jaundiced.

Physical Examination. Poorly nourished. *Eyes, Ears, Nares, Mouth, Neck, Extremities, Heart* all negative. *Chest*: Lungs normal. Liver dullness is a little high on the right. *Rectal*: Patient complained of pain but no particular point of tenderness. *Abdomen*: A mass occupies the whole right and some of the left side of the abdomen, being irregular in shape with several palpable nodules the size of golf balls.

X-ray. Peritoneal cavity filled with oxygen. Enormous shadow seen continuous with liver, shadow occupying whole right half of abdomen and extending 10 cm. to left. Colon follows outline.

Cystoscopy. Trabeculation of bladder wall. Slight congestion about trigone and right ureteral orifice where a catheter is barely engaged. Culture from kidneys: No pathogenic growth.

Urine. Renal function 40% in two hours. Several examinations showed persistent presence of albumen and many pus cells, with an occasional hyaline and granular cast.

Blood. In five counts the whites ranged from 7,000 to 12,000. Reds 4½ mil. Hgb. 80. Wassermann—negative. B. P. 120-90. Differential count showed 62% polys. 28% lymph. 2% myelocytes, 2% eosinophiles and several normoblasts.

Aspiration of one of Liver Nodules: 2 cc. of sanguino-purulent fluid withdrawn and examined revealed many red and white cells, but no scolices. Culture showed staph. albus.

Temperature. Normal except for a temporary rise to 102° following aspiration. Pulse 69 to 105. Respirations averaged 21.

Provisional Diagnosis.

(1) Echinococcus, Cyst of kidney.
(2) Pyonephrosis.

Course. Patient was transferred to the Surgical service and an exploratory operation performed by Dr. R. P. Watkins,* 17 days after his admission to the hospital. He made a slow recovery and left the hospital on Sept. 13th cured.

Final Diagnosis: Echinococcus cyst of right kidney.

Complications

(a) Wound sepsis.
(b) Orchitis, epididymitis.

Operation

(a) Nephrectomy, right.
(b) Incision and drainage.

Operation Record. The tumor filled the entire right side of abdomen from the anterior superior spine upward and extending slightly to left of median line. The most prominent portion was a little below the free border of ribs under the rectus muscle. Incision was therefore made through the right rectus muscle, 6" long from free border of ribs downward. On opening abdomen tumor was found to be covered by a thin membrane which proved to be posterior layer of parietal peritoneum. This was torn through and hand passed around the tumor showed it to be smooth and very tense, with no distinct pedicle, but a very broad attachment on postero-internal surface. An aspirating needle was inserted, and a very small amount of whitish flocculent fluid withdrawn. Incision about 1" long was then made through the tumor, from which immediately gushed a quantity of hydatid cysts. The opening in the sac was enlarged to admit the hand, and about three quarts of cysts were scooped out. Previous to opening the cyst the abdomen was thoroughly packed off with gauze. The interior of cyst was then irrigated thoroughly with saline. An attempt was made to peel the endocyst from the ectocyst, and was successful on the inner half of the cyst, i. e., the half toward the median line. At this point it was noted that more daughter cysts had appeared in the cavity. Investigation disclosed an opening about ¼" in diameter on the outer wall of the cyst from which these were exuding. Enlarging this opening with the finger disclosed the upper half of the kidney entirely filled with another cyst. It did not seem possible to drain this cyst properly, and it was therefore decided to remove the kidney. The kidney was peeled out from its capsule, the pedicle found and ligated with No. 3 plain catgut in two sections. The ureter was isolated and ligated separately and the kidney removed. There was surprisingly little hemorrhage, which was easily controlled by ligature. The portion of the ectocyst which had been left on the inner side was sewed to the inner edge of the abdominal wound, and the capsule of the kidney to the outer edge, thus walling off completely the space left by removal of the kidney. Two large wicks were laid into this space, emerging from lower end of wound and wound closed anatomically from above downward. Condition of Organs Explored: Liver apparently normal, except somewhat pale and small, probably from

*R. P. Watkins, Senior Surgeon of East Surgical Service, Worcester City Hospital.

pressure; gall-bladder normal. Condition of Patient: Moderate shock, no hemorrhage.†

Case 2. A Syrian female, age 52, came to the hospital Dec. 12, 1918, with a diagnosis of empyema made by her local physician. Her knowledge of English was so scanty that practically the only information obtained was that she had been here three times before.

Previous Entries: First admission: In 1909 patient entered the hospital, stating that for the last six years she had noticed a small lump in the upper portion of the abdomen, which had been gradually increasing in size, and that for the last three months she had been having severe epigastric pain lasting about 24 hours, and occurring every four to six days. Physical examination showed a large, nontender, ? fluctuant, epigastric tumor, which did not move with respiration. Several urine examinations were negative. Temperature 98.9°; pulse 80. Family history and past history negative. Operation: On opening the peritoneal cavity a large, firm but fluctuant tumor was exposed which was firmly bound to surrounding tissues by fibrous adhesions. The mass extended downward in direction of pancreas as far as could be reached, and was inseparably connected with the liver. While separating the adhesions, a portion of the mass was ruptured, freeing a considerable number of variously sized cysts which resembled in every respect echinococcus cysts. Microscopic examination of these showed many hooklets. A large trocar was passed into the main tumor mass, but no fluid escaped, so an inch and a half incision was made over the most prominent portion. This opening was packed off and thoroughly irrigated, with the escape of enumerable cysts. The main cyst cavity was then packed with dry gauze, its edges sutured to peritoneum and a rubber tube inserted to it after which abdomen was closed, in layers.

Course. For the next month patient ran a septic temperature of 99° to 103°. The cyst cavity was irrigated every few days with potassium permanganate. Then the temperature and pulse became normal, the discharge from the wound slight, and the irrigations were omitted. At this stage, due to financial troubles, she left the hospital with the drainage tube still kept in the abdominal sinus and with a very slight daily discharge of bile stained material. Final diagnosis: Echinococcus cyst of liver. Relieved.

Second Admission. Four months later patient returned suffering considerable abdominal pain and discharge from the sinus. It is not known if the rubber drainage had been kept in the sinus continually since her last admission because, altho the tube was in place on admission, it was stated the wound had completely healed till about two weeks ago.

Physical Examination: Showed the discharging sinus and the liver enlarged to the navel. Temperature and pulse were normal. Tube could be pushed into the abdomen but a short distance, and there was a small purulent discharge which seemed to be due in great part to the tube itself. The tube was removed and the sinus daily swabbed with iodine. The discharge became progressively less and the sinus began to rapidly heal. Patient discharged with final diagnosis of Discharging Sinus, (Echinococcus Cyst). Relieved.

Third Admission. In 1912 patient re-entered the hospital complaining of slight pain over the liver and fever for the last few days. She was constipated, slept poorly and had a poor appetite. Physical examination showed a large, slightly tender mass connected with the liver in the region of the gall-bladder extending as low as the navel. To the left of this was felt another much smaller mass. Temperature was 99°; pulse was 120; W. B. C. 20,000. Laparotomy was performed and the masses opened with the escape of considerable clear fluid and several daughter-cysts. Three other large cysts (? in the liver) were also opened. The wound was daily irrigated with weak iodine solution and wicked. After five days temperature and pulse became normal, and three weeks later patient was discharged, the wound still being treated with irrigations and wickings. Final Diagnosis: Echinococcus Cyst. Improved.

Present Entry—(Continued). Physical Examination: A well developed and well nourished woman lying in bed in great dyspnea and pain. Pupils equal and react to light and distance, ocular motions normal. *Sclerae* clear. *Throat* and *Neck* negative. *Extremities*: no oedema or skin scars. *Chest*: Flat on the right side up to the third rib posteriorly with absence of breath sounds. Slight bulging of interspaces over this area. *Abdomen*: greatly distended. There was a large, hard tumor on the right extending from the costal margin to the crest of the ilium and to the navel in the mid line. There was also a smaller, hard ? movable mass hanging just below the ensiform. Flat to percussion over these tumors. Temperature 99°, pulse 116; respiration 40; urine: very slight trace of albumen with hyaline casts.

Aspiration of chest: With local anesthesia the needle was inserted in the 8th right space, mid scapular line posteriorly. A small quantity of straw colored fluid was withdrawn. The needle was passed in different directions and small cysts were apparently tapped with the withdrawal of a small amount of fluid from each one.

Microscopic Examination: showed echinococci remnants in the fluid.

Operation: Under ether an abdominal laparotomy was performed. Many peritoneal adhesions were found, and a large cavity opened containing a great quantity of purulent, foul smelling fluid. The fluid was evacuated and two large rubber drainage tubes inserted. Patient was returned to the ward, but grew steadily weaker all afternoon and died in the evening. Final diagnosis: Echinococcus Cyst, secondarily infected. Dead.

†At the last meeting of the New England Section of the American College of Surgeons, held in Worcester, May, 1923, this patient was exhibited in connection with Dr. Curran's talk. The patient reported he felt well and had no further symptoms. He has gained about 40 pounds since the operation.

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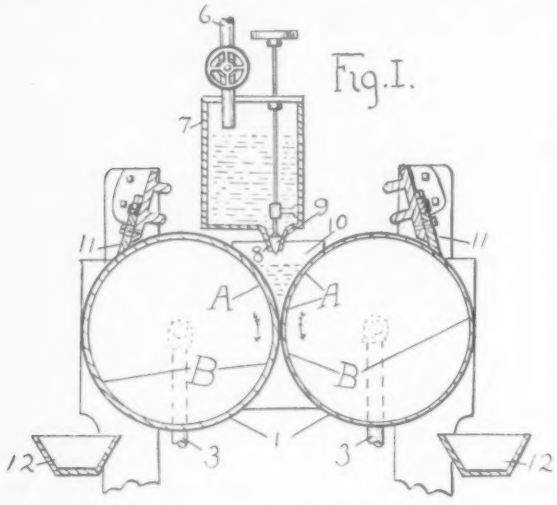
NOTES ON THE EXPERIMENTAL PRODUCTION OF DRIED BREAST MILK

BY LAWRENCE WELD SMITH, M. D., AND PAUL W. EMERSON, M. DD.

[From the Laboratories of the Boston Floating Hospital.]

In a preliminary note, one of us in 1922 commented on the experimental work in progress at The Boston Floating Hospital on the preservation of breast milk by drying. We remarked at that time that in view of the wide use of dried cows' milk as a food for infants, it was strange that apparently no real effort had been made to utilize this same method in the case of breast milk. This paper is intended to record these experimental efforts to which we referred.

The preliminary paper reviewed the literature to that date. Only one article could be found citing the actual drying of such milk, and this was chemically by the use of calcium peroxide. Most of the earlier efforts were confined to the addition of a preservative such as hydrogen peroxide. Reference was made in that paper to the work of Mr. A. W. Bosworth, formerly chemist of The Boston Floating Hospital, who prepared a butter fat from breast milk which could be kept for a considerable period of time and recombined with fresh fat-free cows' milk by means of an homogenizer. This method was

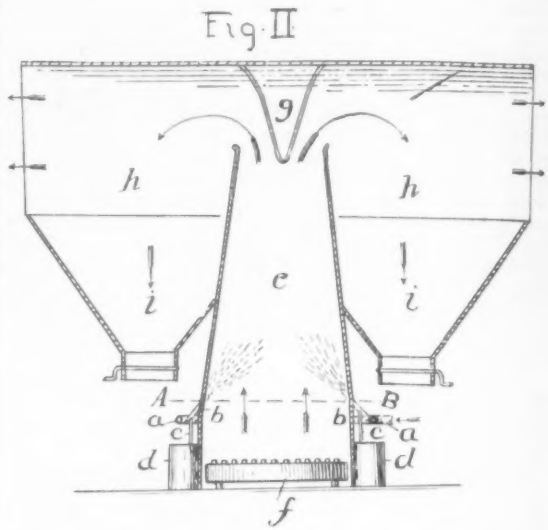


extremely time consuming and expensive. Furthermore, complete destruction of the antiscorbutic content of the milk resulted. To overcome these outstanding objections it was deemed advisable to investigate the problem along somewhat different lines.

To those not familiar with the present day commercial methods of drying milks, perhaps a word of description will not be out of place. There are two general methods in use: (1) the roller method, and (2) the so-called spray method.

The roller process consists of a revolving drum which is heated either by steam or hot water. The milk is fed onto the surface at one side, and the dried product scraped off by a knife blade from the opposite side. This method has been modified in several respects but is still commonly spoken of as the Just-Hatmaker process, after the names of the original patentees. A cut (Figure 1), taken from Hunziker[2], illustrates this method. In this country the process is represented by "Dryco," the product of The Dry Milk Company of New York.

The principle of the other of these is to force



the milk through a needle valve, in the form of a fine spray, into a super-heated chamber arranged with a blower to force the dried powder into a second chamber, where it is collected. The cut below, again taken from Hunziker, illustrates the process. This is the underlying principle, considerably modified, however, involved in the manufacture of KLIM, the Merrell-Soule Company's product.

Each of these methods has certain advantages. The chief value of the spray method is the higher solubility of its product. The roller method is said to produce a powder with a higher antiscorbutic vitamin content. It is, furthermore, more applicable to small quantities of milk, such as were available for our use, and incidentally cheaper to construct. For these reasons, the roller method was decided to be the method of choice, as we could rarely count on more than a gallon of milk in any one day.

After a conference with the consulting engineers of The Dry Milk Company, who gave us freely of their time and advice, and to whom we take this opportunity publicly to acknowledge our indebtedness, with the assistance of the

Mechanical Enginering Department of the Masachusetts Institute of Technology, a modified roller machine of small capacity for experimental work was built. This was admittedly crude in construction, as expense had to be considered. It consisted of a hollow cast iron drum, ten inches in diameter, which revolved at the rate of three times per minute. This was rotated by a small 1/6 H. P. electric motor with a chain drive. It was heated internally by steam the pressure of which could be regulated by a valve from 20-40 lbs. The milk was delivered by gravity from an overhanging aluminum reservoir (the flow being regulated by a valve) and was then distributed evenly over the surface by means of a hard rubber roller. On the opposite side a knife blade was arranged to scrape the dried milk from the drum. The milk was accordingly in contact with the drum for a period of ten seconds—one-half a revolution. The temperature could be varied by regulating the steam pressure. In actual practise, it was found necessary to use from thirty to thirty-five pounds pressure, in order to secure complete dehydration in the ten second interval.

The dried milk as obtained was yellowish-white in color and slightly greasy in texture. The color was probably due to caramelization of some of the sugar and was less marked in the product obtained by drying at the lower range of temperature. The greasy feeling was, of course, due to the fat content of the powder. Chemical analyses of the dried milk were repeatedly made in respect to the simple protein, carbohydrate and fat content. The figures obtained gave a fairly uniform composition, even when specimens were obtained from different women, and showed no particular change from the original. The average composition was approximately as follows, expressed in percentages:

Fat	30%	
Carbohydrate	60%	
Protein	10%	Total 100%

The dried powder as prepared by the present method described is not ideal. Preliminary

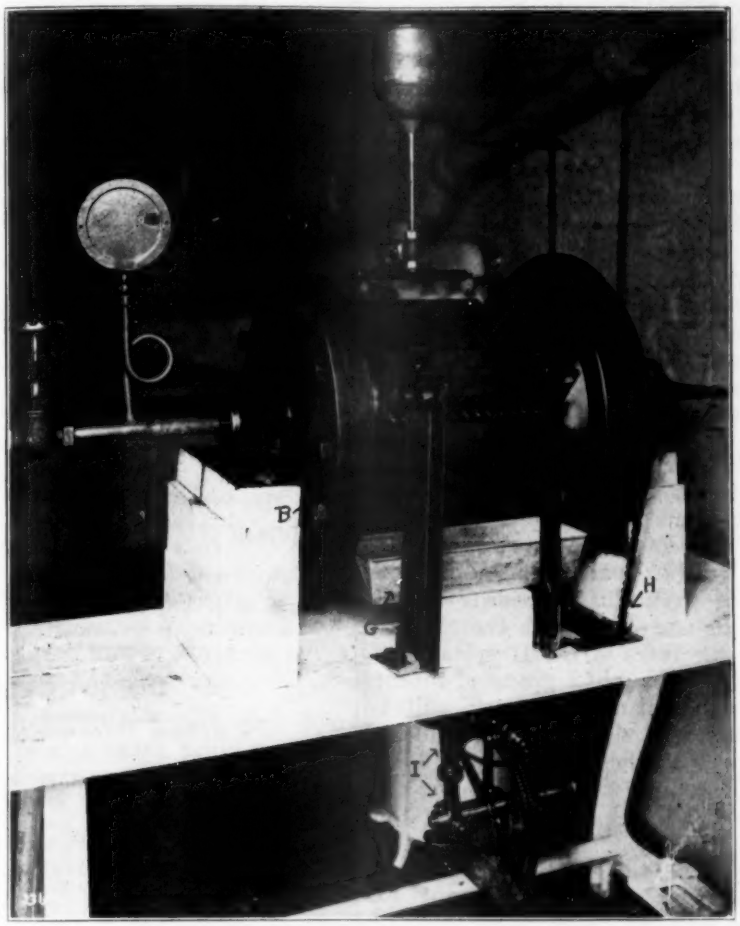


FIG. 3. Modified Roller Type Milk Dryer as used experimentally at the Boston Floating Hospital. A—Milk reservoir with regulating valve; B—Steam heated revolving drum; C—Rubber roller distributor; D—Steam intake valve; E—Exhaust valve; F—Knife in place with supports and adjustable fingers; G—Pan for collecting dried milk; H—Chain drive; I—Motor and worm drive.

chemical analyses seem to suggest that the heat used has been too great, so that a certain amount of its caloric value is lost by carbonization, chiefly of the lactose. The protein fraction likewise by superheating is rendered less soluble and a certain amount of it even may be rendered inert.

An aesthetic feature also enters in. Experimental evidence suggests that keeping the powder for a period as long as two years does not alter its food value nor destroy entirely its antiscorbutic value. It does, however, permit of certain chemical changes, chiefly associated with the fatty fraction, so that after a few months there develops a slightly musty or tallowy odor. In the specimens two years old this is more noticeable than in powders only kept for six to eight months. In experimental animals this does not need to be considered. In feeding babies it is of greater importance. This rancidity can be modified unquestionably by refinements of the present method of production, such as drying the milk "in vacuo" and reducing its initial fat content; and by improving the storage methods, preferably packing and sealing the powder in a partial vacuum, by keeping it away from the light, and maintaining it at a low temperature. This "ageing" is one of the chief difficulties the commercial manufacturers of milk powders have to overcome.

On the basis of preliminary feeding experiments with animals one of us, with the coöperation of the other members of the Hospital staff, has undertaken the feeding of a group of infants with the powdered milk. This work will be reported when sufficient data has accumulated to make it of value. In the meantime the development of the collection of the milk is being carried on. It is hoped that centres can be established where the mothers after proper physical examination can have their breasts emptied, preferably by Sedgwick's method of manual expression. In this way the handling of the milk will be reduced to a minimum. Where this is not entirely practicable, the method in vogue at present, under the able direction of Miss Martha Stark of the Social Service Department of the Hospital, of home collection, can be extended. Perhaps a combination of these methods will be the most satisfactory solution of this part of the problem.

It is hoped that by the presentation of these preliminary observations, others may be stimulated to take up this work in different parts of the country for it seems to us one of the most practicable of methods for reducing infant mortality generally. Everywhere the value of breast milk is being preached. Everywhere breast feeding of infants is being emphasized. Time and time again in acute infections, particularly of the gastro-intestinal tract, the cry has been—if only I could have put that baby on breast milk its life might have been saved. And here is presented a feasible method for having constantly available a supply of breast milk in a dried form, which should be the most satisfactory substitute for fresh breast milk when breast milk is really needed. It should be of tremendous importance in the next decade in reducing the mortality, particularly of premature babies, babies born of debilitated mothers, and babies having acute gastro-intestinal disturbances whether of an infectious or nutritional origin, by maintaining their nutrition through the critical period, on food as nearly identical with fresh breast milk as it seems possible to provide.

SUMMARY

An experimental method for the production of dried breast milk is presented. It represents a modification of the Just-Hatmaker process as used commercially. Criticism of the present method is offered with suggestions whereby it might be modified to secure an improved product.

Finally a plea for the furtherance of the use of dried breast milk as the most logical substitute for fresh breast milk in cases requiring breast milk and where the fresh milk is not available, is made, with an outline of the methods of collection now in use at The Boston Floating Hospital.

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BOOK REVIEW

Stedman's Medical Dictionary. A Practical Medical Dictionary of words used in Medicine, with their derivation and pronunciation, including Dental, Veterinary, Chemical, Botanical, Electrical, Life Insurance and other special terms; anatomical tables of the titles in general use, and those sanctioned by the Basle Anatomical Convention; Pharmaceutical Preparations, official in the United States and British Pharmacopoeias and contained in the National Formulary, and comprehensive list of synonyms. By THOMAS LATHROP STEDMAN, A.M., M.D., Editor of the "Twentieth Century Practice of Medicine" and of the "Reference Handbook of the Medical Sciences," formerly Editor of the *Medical Record*. Eighth, Revised Edition. Illustrated. New York: William Wood & Co. MDCCCCXXIV. Price, $7.50.

In the eighth edition of his excellent dictionary it has been Dr. Stedman's task to include a number of new terms without materially increasing the size of the work. He has accordingly found it advisable to drop the entries regarding the mineral springs of this country and Europe. The volume now also includes the terms relating to dentistry, so that the dental practitioner can find under one cover all the terms which he may find it necessary to use.

Medical nomenclature has given rise to a hybrid and barbarous language, many of the roots being of Greek origin, to which Latin endings have been added. While recognizing such accepted terms, Dr. Stedman has taken pains to include also the proper forms, so that he who continues on his wayward course must accept the responsibility. No one who pretends to write correctly on medical subjects can afford to be without such a lexicon.

Case Records of the Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY

RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 10461

A Swedish widow of seventy-seven entered May 6 for relief of persistent cough. She was very dyspneic, very ill, and very Swedish, and could not be induced to talk. The story was believed to be unreliable.

P. H. Not recorded.

P. I. From a letter from her physician and from a few reluctant remarks it was gathered that she had had some cough and hemoptysis before Christmas and had been comparatively well then. Since that time she had had persistent cough with sputum, frequently raising bright red blood; a temperature of 100°-102°, increasing weakness, and marked loss of weight. There had been apparently some substernal pain, not with exertion. At present there seemed to be some discomfort in the right axilla. A sputum examination had been negative.

P. E. A rather poorly developed, very poorly nourished aged woman, with rapid grunting respirations. Skin showed marked loss of weight. Left arm could not be fully extended because of contracture. *Lung* signs as shown in the diagram. *Heart.* Right border and supracardiac dullness could not be determined because of dullness from lung pathology on the right. Apex impulse in the fifth space. Left border of dullness 9 cm. from midsternum, 3 cm. outside the midclavicular line. Loud systolic murmur over the apex and a very loud systolic over the aortic area. A_2 accentuated. Radials palpable. *Abdomen.* Right side spastic, rendering palpation of the spleen impossible. Entire abdomen tender, particularly in the right upper quadrant. *Pupils* reacted poorly to light. *Reflexes.* Knee-jerks very active. Unsustained clonus. Patellar on the right. *Pelvic* and *rectal examination* showed nothing of importance.

T. 99°-101.5° until the day of death, when it dropped to normal. *P.* 88-128, usually 94-110. *R.* 22-32 until the day of death, then normal. *Urine* normal. *Blood.* Hgb. 60%, leucocytes 8,400, reds 2,450,000, polynuclears 55%, marked achromia and variation in size and shape. *Two Wassermanns* strongly positive. *Sputum* negative for tb. at two examinations. *Stools* negative. *X-ray.* Extensive process in both lungs. On the right the diaphragm was high and its outline obscured. There were no normal lung markings visible on this side. Dullness most marked in the midchest. On the left the outline of the diaphragm was visible, somewhat hazy. Respiratory movements limited. Mottled dullness extending outward and downward across the chest from the lung root. All findings obscured by motion. The patient was too ill to have heart examination.

Orders. May 6. Soft solids. Force fluids. Codeia gr. ½ by mouth every three hours p.r.n. May 7, 8, 10, 11 and 12. Codeia gr. ½ by mouth. May 9. Codeia gr. ½ by mouth every three hours p.r.n. May 12. Potassium iodid gr. xv t.i.d.

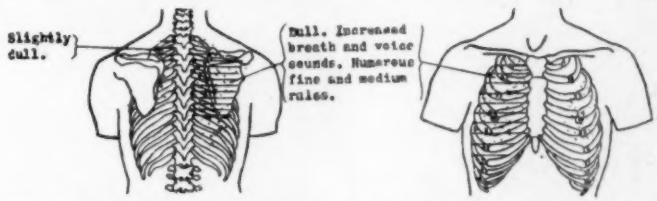
The patient made most satisfactory progress considering the poor condition and prognosis until May 14. Then she suddenly began coughing up much blood; then there was rather free flow. She sank rapidly into a moribund condition and in a few minutes died.

DISCUSSION

BY DR. RICHARD C. CABOT

NOTES ON THE HISTORY

The introductory note sounds as if they thought being "Swedish" was as bad as the other things recorded. This is a classic. They could not get any story, but what they got was unbelievable. So we shall not bear too heavily on this history.



If this state of affairs has lasted from December to May it is of some importance.

I like to speculate, in the early stages of a case, as to what we should be thinking of. This patient is seventy-seven. That is not a natural time for a person to have consumption. That would not be one's first thought about the case, even though there is fever, cough and hemoptysis, which in a younger person certainly would make us think of phthisis.

What else can give us that trio of symptoms? Of course passive congestion of the lungs due to any form of heart disease, though fever is not

so common. How can we account for fever if this is a heart case? Acute endocarditis can give fever, and the other thing which we see most often here is intracardiac clot; intracardiac thrombus gives us fevers which we sometimes work very hard to explain on some other basis.

At her age the condition of the left arm makes us wonder whether there has been an old hemiplegia with contraction. We do not know about that.

One judges that the dullness is more at the top of the lungs than at the bottom, therefore a

Extensive process in both lungs. On the right the diaphragm is high and its outline obscured. There are no normal lung markings visible on this side. Dullness most marked in the midchest. On the left the outline of the diaphragm is visible, somewhat hazy. Respiratory movements limited. Mottled dullness extending outward and downward across the chest from the lung root. All findings obscured by motion.

So that merely because she has fever we do not need to suppose any lung lesion. It still could be all due to the heart. I do not think we can say more without the physical examination.

NOTES ON THE PHYSICAL EXAMINATION

This sort of grunting respiration we see mostly in pneumonia, but also in any sick person, especially if elderly.

little more like tuberculosis than like pneumonia, which is usually at the base rather than at the top. So from the physical examination alone tuberculosis is the thing which is most in our minds so far as the lungs are concerned.

There appears to be some cardiac enlargement,—three centimeters of it.

These systolic murmurs tell us nothing whatever. We can have a systolic murmur with a

normal heart, with an old person's heart, and with various heart lesions. So we have to go on.

"Right side spastic, rendering palpation of the spleen impossible." That is a little queer, but this case is full of mysteries. There may be a transposition of the viscera so that the spleen is on the other side, but I do not see how they knew it. I guess it was the liver they were thinking of.

In an old person the reflexes do not mean very much.

I take it her pulse was regular; nothing is said about arrhythmia.

There is very definite secondary anemia for which we should find some cause.

In fever we do not pay much attention to Wassermann reactions.

In the X-ray plate we see a very extensive process, not at the apex of the right lung but fairly near it, and also a good deal on the other side. We cannot see either line of the diaphragm well, but the patient evidently breathed, so that it is not a first-rate plate, and I do not think we can tell if there is any fluid at the base. There should be either fluid or adhesions at the right base.

On the whole this looks to me like tuberculosis more than like anything else. It does not look like pneumonia, but I cannot exclude that. It does not look like abscess, and we have no other signs of abscess. They are perfectly right, I think, in not committing themselves as to whether they thought it was tuberculosis, or if they did it would not naturally be in this record.

I do not see how anybody could say that could not be bronchopneumonia. If we had an accurate history we should be surer, but from such a history as we have it looks more like tuberculosis than like pneumonia, and there is nothing in the heart that accounts for that.

She died of hemorrhage.

DIFFERENTIAL DIAGNOSIS

It certainly does not sound at all like pneumonia. I never saw a case of pneumonia die of hemorrhage. Tuberculosis is the first thing to suggest itself, but we want to think over the other possibilities.

Patients with abscess of the lung can die of hemorrhage, but we have had no symptoms or history of abscess, and in a woman of this age I think we can rule it out.

Patients with malignant disease of the lung can die of hemorrhage. I do not know that we can rule that out. Metastatic nodules I suppose can give such an X-ray plate. She is emaciated, she could have hemorrhage, she could have fever. I do not see any way that we can rule out malignant disease.

If she were a stonecutter we should have to consider also pneumoconiosis, but that is of course absurd here.

So it comes down in my best guess to a diagnosis between tuberculosis and malignant disease of the lung. If malignant disease of the lung, by statistics it should be secondary to a lesion somewhere else. We have a condition of the abdomen which might cover up a good deal, especially in the right side. We have no abdominal symptoms, but then our whole history is of no significance. She may have cancer of the gall-bladder or of the stomach. It is rather more likely to be of the biliary tract than of the stomach though jaundice is present in most of these cases. She may perfectly well have an ovarian malignancy with nothing said about it. That has happened here a good many times,—persons coming for a metastasis of an overlooked pelvic tumor.

A PHYSICIAN: Is there any possible relation between a positive Wassermann and a hemorrhage perhaps from aneurism?

DR. CABOT: I do not know any. I do not think that can be aneurism in the X-ray picture. A positive Wassermann of course would go with aneurism, and aneurism would go with hemorrhage. But if one can have an aneurism with this sort of X-ray I never saw one yet, and I do not believe it. I believe it is one of the two things we have named, and I cannot think of anything else. When we are in as much doubt as we are here it seems to me that statistics are a good thing to go upon. Tuberculosis is much commoner than malignant disease. If we had a good history I should be quite positive, I think, of tuberculosis. But with so poor a history and with as much as we feel in the abdomen I am almost equally balanced in my mind between those two.

A PHYSICIAN: How would you exclude bronchiectasis?

DR. CABOT: The history is not like it. I have never seen a person with that lesion who did not cough up a lot of pus. So far as we know she did not. And I never knew a person with bronchiectasis to die of hemorrhage.

A PHYSICIAN: Could that shadow on the right side be hemorrhage?

DR. CABOT: Perhaps it could. I have never seen hemorrhage demonstrated as such to produce that sort of lung lesion in the X-ray plate.

On the whole I am going to vote for malignant disease, largely on the condition of those apices. Those apices look to me extraordinarily good for a person who dies of tuberculosis.

A PHYSICIAN: How about syphilis of the lung?

DR. CABOT: I won't make a diagnosis of syphilis of the lung because I never have made it right yet. The little we know about it is that it is usually secondary to a syphilitic stenosis of a bronchus whereby we get a tremendous lot of trouble on one side and nothing on the other. This case does not show such a picture in the X-ray plate. But with two positive Wassermanns I am glad the possibility was brought up.

A PHYSICIAN: Do you think syphilis will be found?

DR. CABOT: No, I think no syphilis will be found.

X-RAY INTERPRETATION

Findings characteristic of tuberculosis.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Pulmonary tuberculosis.
Hemoptysis with secondary hemorrhage from lungs.

DR. RICHARD C. CABOT'S DIAGNOSIS

(Made without knowledge of the X-ray interpretation.)

Malignant disease of the lung, probably metastatic.

ANATOMICAL DIAGNOSIS

1 *Primary fatal lesion*

Tuberculosis of the right lung with bronchiectasis, chronic pneumonitis, cavity formation and hemorrhage into the bronchi and trachea.

2. *Secondary or terminal lesions*

Slight hydrothorax, right.
Luetic aortitis.
Slight hypertrophy and dilatation of the heart.
Hypertrophy of the spleen.
Hematopoiesis in spleen, liver, kidney and lymph glands.

3. *Historical landmarks*

Obsolete tuberculosis of one bronchial gland.
Small foci of obsolete tuberculosis, left lung.
Chronic pleuritis.
Fibrosis of the bronchial glands.
Myoma of the stomach.
Cholelithiasis.

DR. RICHARDSON: We were not permitted to examine the head in this case, but there was considerable blood in the right nostril and mouth. Just below the left clavicle and in the region of the left shoulder and upper part of the right chest there were old scar-like areas and a large irregular area extending from the upper part of the left arm down to the wrist, with some ankylosis of the right elbow. These scar-like areas looked like those following burns.

There was a small amount of subcutaneous fat.

The stomach contained much bloody fluid and blood clot, regarded as swallowed blood. In the wall of the stomach in one place was a very small myoma.

The anterior margin of the liver was well down below the costal border, eleven cm. The diaphragm on the right was at the fourth rib, on the left at the fifth interspace.

The right pleural cavity contained about 200 c.c. of thin pale clear fluid. On the right side the lung was bound down everywhere by old adhesions, except to the diaphragm. The left lung was bound down generally. The trachea and bronchi contained much blood and bloody fluid. The right bronchus and branches showed some dilatation and distortion, bronchiectasis. The first great branch showed the condition quite markedly, and about 2.5 cm. from its opening connected with a cavity 2.5 cm. in diameter. This cavity was walled about with fibrous pigmented lung tissue and contained much blood and blood clot. The tissue of the right lung elsewhere showed marked fibrosis with more or less pigmentation, and here and there smaller and larger areas of pale, fairly good lung tissue. The left lung was voluminous, the tissue generally spongy. There was a small amount of fluid and in two places beneath the pleura small fibrocalcareous masses five mm. across. The left lung, then, was in fairly good condition. The bronchial glands were enlarged, pigmented, and in one of them was a small calcareous mass and some areas of fibrosis. *There were no fibrocalcareous masses in either apex.*

The heart weighed 285 grams,—for her slightly enlarged. It was pulled over to the left by the old adhesions. The outer border of the right auricle was in line with the left border of the sternum. The myocardium was of fair consistence, brown-red. The valves were negative. The coronaries were free and negative. In the aorta there was a moderate amount of arteriosclerosis, and in the first portion areas of old luetic aortitis.

The gall-bladder contained thirty-five stones. They ran all the way from three to eight mm. in the greatest dimension and gave the usual picture,—blackish green, facetted, crushing under the thumb. The spleen was moderately enlarged, with no evidence of tuberculosis.

Death was due to the hemorrhage associated with the tuberculosis of the right lung.

DR. CABOT: What have you to say about the condition of the apices? Why were they so good?

DR. RICHARDSON: I don't know. It is strange, also that there should be no adhesions to the diaphragm on the right with adhesions everywhere else. The apices escape the infection at times. We should also expect to find more tuberculosis in the bronchial glands.

CASE 10462

An Irish gardener of sixty was sent from the Out-Patient Department July 24. The chief complaint was sore throat

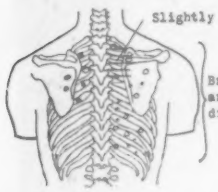
F. H. Good.

P. H. He had quinsy sore throat as a child. At eight years he was thrown from a colt and ran a splinter into the perineum. He had had measles, mumps, rheumatism three years ago, and one carbuncle on the neck.

P. I. In March, five months before admission, he began to have a tickling soreness in the throat, more at night than by day. He had no trouble in swallowing or talking, and no sputum. The cough remained the same until July 14, persistent but not severe, keeping him awake at night. During the first week in May he had three nosebleeds a night. He had had none since that time. July 14 he noticed a swelling on the right side of the neck low down over the clavicle, at first apparently a skin rash, but soon becoming hard and lumpy, and gradually extending up to the right side of the neck, then into the right axilla. With the appearance of this swelling he began to have discomfort on swallowing meat or any solid lump of food. The piece seemed to catch near the swelling. He had had nausea after severe attacks of cough, but no vomiting. His bowels were regular with two doses of castor oil during the past week. Early in July he began to lose strength. In the past few days the rash had progressed very rapidly and had involved the left axilla and the left posterior side of the neck. The right side of the neck pained most. The swellings were not tender, but were generally uncomfortable, and caused "pressure." He had had some dyspnea on exertion, orthopnea, and some precordial pain. Most of the chest pain, however, had been on the right.

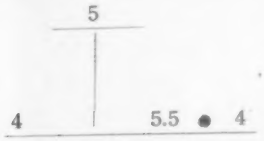
July 26. Shows definite increase in density over the right lower and midchest, also some increase in the lung markings about both roots. Some slight mottling in the right upper chest. Outline of the right diaphragm obliterated. Entire right chest obscured by a large area of markedly increased density. Plate not entirely satisfactory. July 29. Findings the same as previously reported. There appeared to be some displacement of the heart to the left. Barium passed through the esophagus without delay.

P. E. A well nourished, strong, sturdy man with dry irritating cough. Discrete stony hard glands 4 x 4 cm. in the left supraclavicular region with skin not adherent over the surface. In the left posterior triangle were several small glands of the same type. In the right supra- and infraclavicular regions were numerous matted, hard, confluent, slightly tender glands, the skin above them adherent and purple-red. In both axillae were enlarged hard non-tender glands, the skin non-adherent. Chest expansion greater on the left. *Lung* signs as shown in the diagram.



Heart. Apex impulse felt in the fifth space. Percussion measurements as shown in the diagram. Sounds and action normal. *B. P.* 120/75. *Rectal examination, pupils* and *reflexes* normal.

T. 100°-96.2°. *P.* 120-61. *R.* 20-32. Amount of *urine* not recorded, sp. gr. 1.032, the slightest possible trace of albumin at one of two examinations, leucocytes at both, with occasional clumps once. *Blood.* Hgb. 70%-80%, leucocytes 9,600-9,200, polynuclears 86%-75%, reds normal. Lymphocytes seemed large. Platelets very numerous. *Bleeding time* three minutes.



Clotting time 11 minutes. *Serum dilution* 1:18. *Wassermann* negative. *Sputum.* No tubercle bacilli. *Stools* negative. *X-rays* July 26. Definite increase in density over the right lower and midchest, also some increase in the lung markings about both roots. Some slight mottling in the right upper chest. Outline of the right diaphragm obliterated. Entire right chest obscured by a large area of markedly increased density. Plate not entirely satisfactory. *July 29.* Findings the same as previously reported. There appeared to be some displacement of the heart to the left. Barium passed through the esophagus without delay. (Conclusions withheld.)

Orders. July 24. Codeia gr. ½ every three hours tonight. July 25. Veronal gr. x, repeat once if necessary. July 26. Cough mixture* gm. i t.i.d. July 27 and later, morphia in 1/6 grain dosage once a day to every three hours p.r.n., during the last days with atropin gr. 1/120. July 27. Codeia gr. ½ at eight o'clock. July 29 and August 1, 2 and 3. Cough mixture as above. August 5. Digitalis gr. iss t.i.d.

July 29 a biopsy was done, a gland being removed from the left side of the neck. Within a few days the patient had considerable difficulty in getting his breath and was very uncomfortable. August 9 he died.

*Codein phosphate gr. viii, potassium citrate 3 iii, syrup of hydriodic acid to make ℥ iv.

Discussion

BY DR. MAURICE FREMONT-SMITH

NOTES ON THE HISTORY AND PHYSICAL EXAMINATION

The history is rather unusual, the chief complaint being of sore throat of five months' duration. The first description of the lesion on the neck is unusual, and very difficult to visualize without seeing the patient,—a swelling which was in the nature of a rash, and that rash spreading up the neck and down into the axilla. The probability from the history seems that he had a lesion in the larynx or pharynx, probably neoplastic, and probably metastasizing to the glands of the neck and to the skin. It is an unusual type of metastasis.

Evidently from the diagram there was more dullness above than below. Percussion was normal.

DIFFERENTIAL DIAGNOSIS

From this story and physical examination we are left rather in a dilemma. The picture does not seem to be typical of either of the two likely possibilities. I feel that carcinoma metastasizing from somewhere to the supraclavicular glands, then invading the glandular chain and metastasizing into the skin and into the chest probably by direct extension, is the first possibility. On the other hand, there are several things against that. In the first place carcinoma when primary in a region metastasizes usually to one group of nodes, and that group of nodes is very distinctly enlarged, and other groups for the time being at least escape. Here we have the nodes on both sides of the neck not equally but very definitely involved. In the second place, with a carcinoma with metastases of this extent one would expect more of an anemia, if the hemoglobin readings are correct. I think our hemoglobin readings are probably very nearly valueless taken as they are. If one will compare the colors in two Talqvist books one will find that the colors of the same number are not the same.

The other possibility is a so-called Hodgkin's disease, which of course usually—in more than fifty per cent. of cases—starts with enlargement in the glands of the neck, and with enlargement of discrete glands that in a large proportion of cases do not mat together, and over which the skin does not become adherent. Later on and before death, usually other glands are involved, the spleen and liver too in a large proportion of cases. But Hodgkin's does not start in the throat or in the larynx as a sore throat, persisting for five months before any glandular enlargement. The blood picture is not consistent with a late Hodgkin's, although the blood pic-

ture late in Hodgkin's is not typical. But we should expect to find a high polynuclear increase and a higher white count than this, and again we should expect a definite anemia.

If we assume that the lesion is a carcinoma and probably a carcinoma in the region of the larynx, we wonder why the symptoms of aphonia, hoarseness, and cough were not the first to appear. It is possible to have a carcinoma of the larynx not in the region of the vocal cords, but either above or below, without any involvement of speech until the process has progressed to a pretty definite degree. In carcinoma of the larynx a symptom which comes late and which we do not find here but which is worth mentioning is pain referred to the ear.

Of course a carcinoma anywhere in the head would eventually metastasize to the supraclavicular glands. All the lymphatics of the head, the collar group around the neck, the mastoid, the parotid, the submaxillary, and the submental, all drain into a vertical chain of lymphatics which in turn drain into the supraclavicular glands. It is extraordinary however to have the first metastasis into the supraclavicular glands excepting in cases of carcinoma of the esophagus or stomach, where we know it does occur here first.

I feel that we have to assume carcinoma in the larynx, probably above the vocal cords, or carcinoma of the throat, with metastasis.

Dr. Holmes, will you comment on the X-rays?

DR. HOLMES: I cannot add a great deal to the report. On the right side all the lung markings are obliterated. The chest is of about the same density as the heart shadow. We were not able to make out the diaphragm or the right border of the heart. Such an appearance can be due to the absence of air or to fluid overlying the lung and compressing it so that the X-rays do not get through. That is due to a considerable amount of fluid in the chest or to complete obliteration of that lung.

The heart extends considerably further to the left than is normal. From the curve it looks enlarged as well as displaced. So that we could explain the position to the left by saying that the heart was considerably enlarged to the left, or that the heart was displaced to the left by this process on the right side. I should be rather inclined to favor the latter, that there may be some enlargement of the heart, but not much, and that the reason the apex appears to the left is due to displacement.

A new growth infiltrating the lung will displace the heart in the opposite direction. So will fluid. In the early stages of the growth the heart is likely to go in the other direction. That is, we get collapse of the lung, and as the process goes on and we get a large part of the lung infiltrated with the growth we get displacement in the opposite direction, as it is here.

The upper border of the dull area is very indistinctly shown. In fluid the highest point is likely to be in the axillary border unless the patient has been tapped and there is air in the chest. This would seem to be a little more on the inner than on the outer side. What little evidence we have is rather more in favor of a growth infiltrating the lung than of fluid. I think it would be impossible to say which.

DR. CABOT: I seem to see a little light coming through at the right border of the plate. Is that enough to count against fluid?

DR. HOLMES: In the extreme periphery of the chest there is always a little more radiation getting through. We are looking through the apex of a cone.

DR. CABOT: You don't say anything as to the diaphragm on the left. Can you see anything of it?

DR. HOLMES: Yes. In the second plate we can see the diaphragm distinctly on the left. It is not unusually high.

DR. YOUNG: The lung markings there are more marked. Is that enough to suggest metastasis? Is that anything more than compression?

DR. HOLMES: They are more marked than is normal, but not enough to suggest metastasis. As we see these cases we may get metastases through the lymph or through the blood. If through the blood they are round, sharply defined masses. If through the lymph they are not characteristic.

DR. BOCK: I saw this patient. It was very interesting to me because in June we had a patient in with bilateral enlargement of the glands of the neck, with glands in both axillae, with a superficial ulcer on the under side of the tongue, and the surgeons thought the patient had a carcinoma of the tongue. But it seemed to me extraordinary to have such extensive metastases to the glands of the neck. In consultation Dr. Wright said that when we have peripheral glands of such size tied down to the skin of the neck their commonest source is carcinoma of the esophagus. On the first of August, when I saw this man, he had very large glands on the right side of the neck with the skin adherent, as well as enlarged glands on the left side and in both axillae. He had a history of an irritating cough. I thought that on the basis of the other case, and assuming that Dr. Wright's idea was worth about ninety per cent. in this instance, this man had carcinoma of the esophagus. Both patients lived about six weeks from the time when glands were first noted in the neck. We ruled out Hodgkin's because of the skin's being tied down to the glands, which seemed to me unusual for glands of that type.

DR. ROBBINS: Apparently there was no rash at all; it was simply a discoloration of the skin.

DR. CABOT: I think I shall guess it is cancer of the lung.

DR. HOLMES: This man did have a barium meal for carcinoma of the esophagus. It was

negative. A barium meal for carcinoma of the esophagus should not be accepted as negative evidence.

DR. ROBBINS: I should like to ask if there is primary carcinoma of the bronchial glands.

DR. CABOT: I meant not in the glands but in the bronchial tubes, starting from the bronchus.

DR. ROBBINS: You mean primary?

DR. CABOT: Yes.

X-RAY INTERPRETATIONS

July 26. Findings are suggestive of fluid at the lower right base and a pathological process in both hilus regions, with infiltration of both lung fields.

July 29. Findings are suggestive of fluid at the right base.

BIOPSY—PATHOLOGICAL REPORT

Microscopic examination of a gland from the neck shows small clusters of undifferentiated epithelial cells, many of them being vacuolated, and reactionary fibrosis.

Metastatic carcinoma.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Carcinoma of the esophagus with metastases to the supraclavicular lymph nodes.
Asphyxia.
Tracheal obstruction.

DR. MAURICE FREMONT-SMITH'S DIAGNOSIS

Carcinoma of the larynx, with metastases.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Adenocarcinoma of the esophagus with metastases in pleura, lungs, pericardium, myocardium, and various lymph glands.

2. *Secondary or terminal lesions*

Purulent bronchitis.
Edema of the lungs.
Congestion of the liver, spleen and kidneys.
Wet brain.

3. *Historical landmarks*

Chronic pleuritis, right.
Chronic perihepatitis and perisplenitis.

DR. RICHARDSON: The pia was markedly infiltrated with thin pale fluid. The vessels of Willis, sinuses, and middle ears were negative. The brain weighed 1490 grams. The tissue was wet, otherwise negative.

At the base of the neck on each side just above the clavicle was a short linear scar. The feet and ankles were slightly swollen and pitted on pressure. The right hand was a little puffy. In the region of the right elbow there was swelling and pitting.

The abdomen was not distended; the wall was soft. The subcutaneous tissues were wet. At the base of the neck just beneath the clavicles the subcutaneous and muscle tissues were markedly infiltrated with new growth tissue. The axillary glands were greatly enlarged and infiltrated with new growth tissue.

In the esophagus beginning at a point five cm. below the upper end and extending down along the tubes there were in scattered places nodules of new growth which macroscopically seemed to be pushing into the wall of the tube and not arising from the stratified layer, because at every place that layer seemed to be fairly smooth, although at points very thin and veil-like. The bronchial glands were greatly enlarged and infiltrated with new growth tissue. The pleura on the right was invaded by new growth tissue, and there was also on the right side a fibrocalcareous plaque, one of those plaques which are associated with chronic pleuritis.

In the right lung there were smaller and larger masses of new growth tissue, and these pushed up the posterior wall of the pericardium, invading both the visceral and parietal layers, and in places extending into the myocardium. The pericardium contained at least 1,000 c.c. of bloody fluid and dirty reddish fibrinous material. On the left side there was no pleuritis, but in various places masses of new growth in the lung.

DR. CABOT: In the pleura?

DR. RICHARDSON: The pleura was negative on the left. The new growth was in the lung tissue. These tumors in the lung on the left side rounded up beneath the pleura in places, but otherwise had no relation to it. On the right side there were areas of new growth in the pleura.

The larynx was negative. There was some purulent bronchitis.

The retroperitoneal glands along the abdominal aorta were slightly enlarged and showed invasion by new growth tissue.

The heart valves were negative.

The liver was negative except for some congestion and chronic perihepatitis. There were old adhesions about the spleen, which was otherwise negative.

The new growth was closely associated with the esophagus and also closely associated with the pleura and the pericardium, and there were masses in the lungs. The typical tumor of the esophagus arises from the stratified epithelium, but some of these tumors are adenocarcinomatous in structure, and to this group this case belongs.

CASE 10463

An American carpenter of twenty-eight came to the Emergency Ward July 2 complaining of pain in the left lower quadrant.

F. H. Good.

P. H. The diseases of childhood were in doubt. He had had no other illness except gonorrhea at twenty-six. He had a tendency to constipation.

P. I. The January before admission he had an attack like the present one, in March another attack, a little worse, with vomiting, and in May another. The present attack began the night of July 1 after supper with severe generalized pains in the lower abdomen, at moments more noticeable just to the left of the midline, at others just to the right. Later he felt the pain also in the lower back. Flexing his thighs, especially the right, gave relief. All the attacks had lasted about forty-eight hours and were accompanied by constipation.

P. E. A well nourished man looking ill and uncomfortable. He was seen for the first time twenty minutes before the operation. The examination was negative except for the *abdomen*, which was held rigid all over. Generalized tenderness throughout with deep pressure.

Before operation *T.* 99.5°-101°, *P.* 75-94, *R.* normal; *urine* not recorded; leucocytes 15,000. *Wassermann* negative.

July 3 operation was done. The patient made a good ether recovery and the next morning voided normally. The temperature was 99°. He complained only of some soreness in the incision area.

At two o'clock he rather suddenly became dyspneic and his pulse rose quickly to 150. The abdomen was soft and not distended. He began to perspire freely and seemed in rather great respiratory distress. There was slight cyanosis of the lips. Examination showed marked dullness over practically the whole left chest. Breath sounds could be obtained only at the apex. The right chest had normal resonance throughout with a few inconstant subcrepitant râles at the base. The patient had had a hypodermoclysis a short time before, so that the apex of the heart could not be made out easily by palpation. The leucocyte count was 20,000. That evening his general condition seemed very poor. He was still dyspneic, with a pulse of 160 and weaker in quality, though still regular. He continued to grow worse. Early the next morning the respirations rose to 40 and the dyspnea increased. Then after a decided drop in both respirations and pulse he died.

Discussion

BY DR. EDWARD L. YOUNG, JR.

This is then his fourth attack.

If we changed one word here there would be no slightest question of diagnosis. If we changed "left" to "right" we should have as nice a story-book picture as we want. Of course in a great many diagnoses there is one thing wrong, and we have to go on the majority. Then too if we take any case of acute abdomen and say appendix we shall be right more times than wrong. But here is a man comparatively young, with repeated attacks of generalized pain followed by nausea, and even though it is left-sided it seems to me the best diagnosis is appendicitis. There are rare conditions which will fit in here. The persistence of a Meckel's diverticulum that gets inflamed is occasionally seen. It is not common. Still rarer is the gangrene of an epiploic appendage, which will simulate appendicitis. Diverticulitis of the sigmoid is not the clean-cut acute attack that this is. There is chronicity back of it with evidence of trouble as a rule. Moreover it is not often a disease of twenty-eight.

On physical examination they found evidence apparently of appendicitis which demanded immediate operation. It did not take them long to make up their minds to that.

This is the temperature we expect with acute appendix. The temperature very seldom is over 102°, and the ordinary temperature of acute appendicitis, even a pretty sick one, is 99° to 100.5° or 101°.

According to the rule here the urine was done and was negative. That is routine to differentiate between the occasional case of acute pyelitis or renal colic.

A leucocytosis of 15,000 is the leucocytosis of a mild acute appendix.

On the story here I should assume that the man had an acute appendix, and should go in on that basis. I do not see that we have any history to suggest anything else, such as perforation or some one of the other unusual types of trouble just mentioned.

DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Acute appendicitis.

PRE-OPERATIVE DIAGNOSIS

Acute appendicitis.

OPERATION

Gas and ether. Low right rectus muscle splitting incision. The peritoneal cavity was opened, revealing a considerable amount of free pus. The intestines were all tremendously dilated. The appendix was located with great difficulty and found to be lying over the brim of the pelvis in the midline and pointing toward the left lower quadrant. The cecum and mesoappendix were adherent to the pelvic floor. The appendix was freed with finger dissection and brought nearer to the midline. The mesoappendix was clamped and tied with considerable difficulty and the appendix amputated without attempting to invaginate the stump. A cigarette wick was placed to the stump of the appendix and another along the right pelvis, and the omentum pulled down to cover the area as much as possible. The wound was closed in

the usual manner. The condition of the patient at the end of the operation was fair.

PATHOLOGICAL REPORT

An appendix 5.5 cm. long. The surface is covered with an inflammatory membrane. Tip obliterated. The mucosa is purplish-red.

Acute appendicitis.

FURTHER DISCUSSION

In spite of the fact that he had a localized peritonitis there is no reason to assume that he will not do well, because the majority of these cases do even with this amount of infection.

The leucocyte count does not mean anything after operation. Even with a clean operation for hernia we get a leucocytosis of 20,000.

I suppose he died of pulmonary embolism. I should like a medical opinion as to how far that examination of the chest may be borne out by the amount of damage from the embolus; that is, does the fact that the whole chest was dull mean a pretty massive dullness, or isn't percussion of much value in such a case?

DR. CABOT: I have seen a whole chest dull as the result of a pulmonary embolus when it was a big one.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Ruptured appendix.
Operation.

DR. EDWARD L. YOUNG'S DIAGNOSIS

Acute appendicitis.
Pulmonary embolism.
Localized peritonitis.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

(Acute appendicitis.)

2. *Secondary or terminal lesions*

General peritonitis.
Serofibrinous pleuritis, left.
Atelectasis of the left lung.
Edema of the right lung.
Acute pericarditis.
Soft spleen.

3. *Historical landmarks*

Operation wound for ruptured appendix.
Obsolete tuberculosis of a mesenteric lymphatic gland.

DR. RICHARDSON: In the peritoneal cavity there was general peritonitis, the condition well marked in the region of the appendix. The gastrointestinal tract otherwise was out of the picture.

In the left pleural cavity there was at least 2000 c.c. of cloudy fluid and fibrin,—marked serofibrinous pleuritis. On the left side there was marked atelectasis of the lung, pushed up by the fluid.

The spleen was a little soft.

DR. YOUNG: There was no embolism. That is the third time within two or three months that we have seen this sudden collapse with sepsis, once before with pneumonia only, and this with general sepsis.

A SURGEON: Could that amount of fluid in the left chest have developed since the time of operation?

DR. YOUNG: I do not believe that that amount of purulent fluid could come in the chest within eighteen hours. I think it was there before and that it was a general septic process both above and below the diaphragm.

A SURGEON: Would you call this a collapsed lung?

DR. CABOT: Just from pressure or fluid, not a massive collapse.

A SURGEON: Would there be an accumulation of fluid with massive collapse?

DR. CABOT: Not in my experience. In the cases I have seen it has been a dry chest.

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HERNIA FOLLOWING APPENDECTOMY

WATSON, LEIGH F. (*Chicago Medical Recorder*, March, 1924).

The usual causes of this hernia are postoperative suppuration in the abdominal wall; the use of drains that are larger than necessary; a faulty closure of the muscle and fascia layers; the division of nerves supplying the muscles; and the use of the wrong incision. The McBurney incision gives the lowest percentage of postoperative hernias.

An elliptical incision should be used if the sac is thin and adherent to the skin; if the sac is not adherent, a vertical incision saves time. Nothing is gained by opening the fundus—the adhesions here often make it difficult or impossible to reach the neck of sac—and time is saved by beginning the dissection at the neck and working inward. The author found that the simplest method of exposing the hernial opening is to invert the sac on one or two fingers, and feel the sharp fascial edge which is usually most distinct on the outer side of the hernia near Poupart's ligament. With the finger as a guide, the incision is made directly down to the fascia. The abdominal wall should be reconstructed as well as possible, and the muscles and fascia used as a single flap which is brought down and broadly overlapped by a second flap secured below from the external oblique aponeurosis.

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INCREASING SERVICE

THE will of Mary Rich Richardson, filed recently at Newport, R. I., provides for a bequest to the Massachusetts General Hospital of $1,000,000 to be used in the construction of a ward or branch hospital for the treatment of persons of limited means—the so-called middle class hospital, the need of which has been felt so greatly. Mrs. Richardson was the daughter of Richard Baker, and the new hospital will be a memorial to her parents.

Under existing conditions of medical practice; conditions that frequently require the hospitalization of patients for proper study and treatment, the rich and the poor have derived the greatest benefits. Practically every large community has hospital facilities for the needy; for those who are willing to go into the open ward and onto the general service when such care is required. Expensive private hospitals and wards are also provided for those who are able to avail themselves of such luxuries. and it is to this type of hospital that persons of moderate means are often forced to resort at an injustifiable expense to themselves or their families.

In providing hospital service suited to the needs and to the ability to pay of this important class of the community, the Massachusetts General is literally breaking new ground. That availability of good medical service should not be confined to those seeking it as a charity and to those with the means of paying the highest price asked. The middle classes of society, certainly equalling in importance the other two, deserve equal consideration. The value of the Massachusetts General Hospital of over a hundred years to the community will be still further increased by this addition.

This hospital, one of the first two or three general hospitals in this Western Hemisphere, has gone about its business of providing for the sick, of training skilled physicians, and of adding to the knowledge of disease and its treatment, very quietly and unostentatiously since 1822. Although it has gradually increased in size from the single gray stone building that first housed it to its present varied collection of wards and other structures, no single notable addition to its equipment has been made, saving perhaps the Phillips House, until the present year.

The new research laboratories are now in process of construction, and will be completed before another summer. The means of erecting the middle-class hospital have been received. With such a start it is not difficult to look into the future and vision the possibilities of this famous institution that holds such a warm place in the hearts of all of us.

Some day perhaps we shall see a modern ward for children, an obstetrical department, a department for the hospitalization of contagious disease—a crying need—and far better facilities for various other specialized branches of medicine that now require them. Then, indeed, this hospital will be able to boast that it can compete with any in the world in the scope of its service to the public and in the magnitude of its possibilities for furthering the study and the progress of medicine.

EXAMINATION OF FOOD HANDLERS

BUFFALO has recently enacted an ordinance requiring all persons engaged in the handling of food commodities for sale or service to the public to furnish a medical certificate issued by the Department of Health. This certificate is to the effect that the person presenting it is free from infectious disease in communicable form. The ordinance also applies to those who handle the utensils with which food is served.

Examination may be made by private physicians at Health Centers, or at the Department of Health, but the blanks supplied by the Department must be used.

Such a requirement is a great advance in protecting the health of the public. Its value, however, is greatly limited unless frequent reexaminations are also insisted upon. An individual's freedom from infectious disease at a

given time cannot be accepted as a guarantee that he may not be contagious in a very short time afterwards.

THE PALMER MEMORIAL NEEDS FUNDS

FACILITIES for caring for those who are suffering from an incurable disease are so few in this community that there is always a demand for accommodations for these unfortunate people. One of the few institutions designed to meet this need is the Palmer Memorial Hospital which is sustained by the New England Deaconess Association. The expenses of the Palmer Memorial for 1923 were $50,226.88, the receipts were $47,188.07, leaving a deficit of about $3,000. The hospital accommodates about 36 patients and during the year 1923 59 were admitted. By far the greatest number of these were cases of carcinoma. The total patients days treatment was 12,475, the average patients per day 29. Efforts are now being made to secure subscriptions which will wipe out the deficit, and provide funds for the current year. It is hoped that this very worthy charity will obtain all the help which it needs.

CORRESPONDENCE

LONDON LETTER

(From Our Correspondent)

HOSPITALS IN LONDON

On July 25 last there was held in London a special meeting of the General Council of King Edward's Hospital Fund for London, presided over by the Prince of Wales.

The Prince in his speech sketched so accurately the present situation of the voluntary hospitals in London that the greater part of it is well worth quoting. He wondered if there was anyone who still thought that the voluntary hospital system was dead or dying. If so, let him look at the facts and figures. Even in 1920, when the crisis was at its worst, the hospitals of London had an income of £2,400,000 ($12,000,000), as against £1,500,000 ($7,500,000) before the war. Since 1920 their income had increased to £2,850,000 ($14,250,000), without counting any of the £400,000 ($2,000,000) raised by the Combined Appeal; £990,000 ($4,950,000) had been added to their endowments; and £1,100,000 ($5,500,000) had been received for extensions and improvements. This meant that over and above their annual income, which last year was nearly twice what it was before the war, the voluntary hospitals in London alone had received in three years £2,500,000 ($12,500,000) for special purposes. And this did not include the additions, during this same period, to the investments of the King's Fund itself. Then again, there were 1600 more beds than there were before the war, and the extensions schemes now in hand, or proposed would add another 1000.

This was not decay or death; it was life, and very vigorous life. More than that, it was growth. The hospitals were not satisfied with merely making both ends meet; they were constantly expanding in response to the ever-growing need for better equipment and more beds. There were, unfortunately, some institutions still in grave financial difficulties. And the hospitals were all faced with the increased expense involved in new methods of medical diagnosis and treatment.

The chief reason for the special meeting of the General Council of the King's Fund was to obtain leave to distribute for extension purposes considerable legacies left by will recently. Such leave was granted.

CONFERENCE ON TUBERCULOSIS

The National Association for the Prevention of Tuberculosis held its tenth conference recently at the House of the Royal Society of Medicine, Wimpole Street. Sir Arthur Stanley, chairman of the council, presided. The audience was large, including many visitors from abroad.

Mr. Wheatley, the Minister of Health, addressed the meeting. He said in part that one thing which ought to encourage them in this great work was that a winning fight was being carried on. Tuberculosis was slowly but surely being eliminated. The fall in the death rate began when the food supplies commenced to be cheaper, and it had continued with the improvement in general sanitary conditions. The rate of progress would be measured, he thought, by the rapidity with which the conditions which caused the disease were eliminated.

There was sometimes considerable doubt as to the value of sanatoriums in the treatment of the disease, but he thought they were of undoubted value in the education of the patient in the rules of health. The great problem they had to face at the present moment was what to do with patients after leaving the sanatoriums, comparatively strong persons. It was discouraging to those who assisted in this movement to find that they had to send them back to housing conditions which they knew were quite unsuitable. The Ministry of Health wished to impress upon local authorities that a closer link was needed between the sanatoriums and the living conditions of people suffering from tuberculosis when they had finished their period in those institutions. Since 1919 the Ministry had been impressing on local authorities not only the advisability but the almost economic necessity of establishing active, intelligent after-care committees in each of their areas. He would like, therefore, every local authority to proceed without delay to organize an "after-care" committee. It was better for the local authorities to take the initiative in organizing these "after-care" committees, and to be the supervising authorities and driving force in carrying on the work. Until decent housing conditions were established they would not get rid of tuberculosis. He thought the general sanitary condition of a district was something in which the ordinary citizen should take an interest, because it directly affected his health and the health of his dependents.

A good deal of educational work could be carried on in regard to the purity of the milk supply. He thought there was a deplorable lack of knowledge of the evils that were perpetrated in this country by the condition of much of the milk that the people consumed.

After they had done that, they were still left with the much greater problem of providing some means of livelihood for these people. He frankly confessed that he did not know how to get over that difficulty. If it were possible to select, amid all the competition of today, particular forms of work for these people, with a reasonable amount of state and voluntary help, then along that line they might find some relief. They must look beyond the present village settlements for some other means of dealing with the problem. He had often wondered whether they could not have some scheme of workshops to which these people could go, and return at night to reasonably suitable homes to live their ordinary lives.

There was also the difficulty of finance. It was a difficult thing, even under a Socialistic government,

to get money out of the Treasury. He had already formed the view, after six months of Ministerial, that whether there was a Conservative or a Communist government in power, the Treasury would remain quite independent. So if they wanted him to get anything out of the hard-hearted Treasury they must show him some practical scheme worthy of financial support. If, as a result of their deliberations, they could formulate a practical scheme with which he could experiment, they might be able to do something which would be applicable to the whole of the country.

The discussion was lengthy, and at its close the chairman said there was a kind of suggestion in Mr. Wheatley's speech that the conference should work to strengthen his hands; and he, therefore, moved a resolution urging that what was most needed in the work of prevention of tuberculosis was the better provision for "after-care," including workshop schemes; and asking that the council of the association be instructed to give special consideration to the matter and to submit definite proposals to the Minister of Health.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION

Medical meetings, sanitary meetings and conferences dealing with health matters abound at this time of the year—indeed, it is almost futile to attempt to give even a scanty account of them. Of the more important of these meetings the annual gathering of members of the British Medical Association comes first, and a special report will be given of this.

Among the other meetings of note which have taken place recently is the scientific session of the Medical Women's International Association, which was held in London on July 17 last. The subject discussed was maternal morbidity.

Lady Barrett, the president of the association, in opening the discussion said that the causes of maternal morbidity were in effect the same as those that accounted for maternal mortality, namely, sepsis, hemorrhages, toxemias of pregnancy, difficulties in labor, and complicating diseases, such as heart disease. The point of Lady Barrett's paper was that in theory enough was known to reduce the present maternal mortality and its dependent maternal morbidity by one-half, as had indeed been done in certain areas of England. The task before them was to see that this knowledge was put into practice in every county and district of the land.

Dame Janet Campbell pointed out that while the infant mortality rate had been very considerably reduced during the past 20 years, the maternal mortality rate (1-250) had remained almost unaltered.

Dr. Sylvia Chapman, New Zealand, described the "Safe Maternity Campaign" which had been inaugurated there. During the past five years 755 lives had been lost through puerperal deaths among a population of 1,000,000, and this was attributed to two causes: the lack of proper antenatal supervision and the existence of private maternity hospitals, run by midwives not fully competent for the work.

Dr. Alina Ilnicka of Warsaw dealt with morbidity among working mothers, which was greater than that among those who did not work. Not only was the manual worker in Poland badly situated but the professional woman also, who did her six or eight hours of work and then returned to do the home duties, very few being able to afford a maid servant. In Poland women were given eight hours' leave before and six weeks' after childbirth—a longer period after childbirth if required. The infant mortality rate was 39 per cent. lower in cases where the mother remained from work three months or longer.

Dr. Kate Mead of Middleton, U. S. A., said that in her town there were nine visiting nurses among the 25,000 inhabitants, and they went to the houses of both rich and poor. All women, irrespective of their position or means, expected to go to the State hospital for their confinement. The midwives were not very good.

Dr. Rosamund Leacock of Canada outlined the conditions of maternity work in Canada, where there were practically no midwives—only a few women who were allowed to manage cases living more than 30 miles from a doctor.

Maternity work in Russia was described in considerable detail by Dr. V. Lebedeva, Director of the National Department for the Protection of Maternity and Child Welfare in Soviet Russia. She said in part that, owing to the facts that her countrymen regarded motherhood as a social function and infants' welfare as a task of the State, and because woman was always regarded as force as far as work was concerned, the creche occupied a more important place by far than in other countries. The leave period for Russian mothers secured by law was four months for manual workers and three months for brain workers. In the large centers of population there were consultation clinics for infants, young children and pregnant women, tuberculosis and venereal disease dispensaries, feeding centers and milk canteens. On January 1, 1924, there were in Russia 545 creches, 185 children's clinics, 44 mothers' clinics, 107 homes for mother and child, 401 homes for children, and 35 maternity homes.

Mme. J. Reguin of Paris described the preventive work done in France, where there were free antenatal clinics in connection with a hospital, a laboratory, a venereal disease and a tuberculosis dispensary. She emphasized the need for coöperation between doctor, midwife and health visitor for educating women as to the importance of antenatal care.

Dr. Signe Swensson of Norway laid stress on the importance of diet in the pregnant period and dealt at length with the question of the vitamin content in the present-day artificially prepared foods.

LUNCHEON GIVEN BY THE LANCET TO OVERSEAS MEDICAL MEN

The Lancet gave a luncheon at the Hotel Victoria, London, on July 17, to the Overseas Medical Representatives (among whom the United States was represented) visiting Great Britain in connection with the British Empire Exhibition.

Sir Ernest Hodder-Williams, C.V.O., the chairman of *The Lancet*, presided. He welcomed the guests, numbering about 60, in a genial, breezy speech. He said that while sometimes he had had to take unpleasant medicines prescribed by doctors he was not going to get some of his own back on them by inflicting on them a long speech. With reference to the recent centenary of *The Lancet*, he thought that in the hundred years which had thus been commemorated nothing was more remarkable than the way in which there had come into being a real unity of work and purpose in medicine among the English-speaking peoples, to the immense benefit of medicine and mankind. The dominions overseas had given of their very best to the old country, while the old country on her part had certainly reciprocated. British medicine recognized no sundering seas.

Science had no nationality. As Pasteur had said: "Knowledge is the patrimony of humanity, though at the same time it should be the highest personification of nationality. Let us strive, then, in the pacific field of science for the preëminence of our several countries." The records of these strivings, of success, and of failure, which is often the precursor of success, were to be found in the pages of the paper which he represented, and more and more space would be devoted in the years to come to the record of the doings and attainments of their overseas visitors.

Sir Squire Spriggs, the editor, associated himself with the chairman's words of welcome and regretted that duty had prevented the gathering from being

larger, as many who had responded to the call of Imperial celebration by coming to the mother country had had to return home; but even in these circumstances the quality of the response to the invitation was significant. As an example of the spread of medical knowledge and increased facilities of intercommunication, he pointed out that in a copy of *The Lancet* dated a little more than 100 years ago he found the first foreign communication. It was about half a column in length and had taken seven days to travel about 240 miles. That was foreign correspondence in 1824. And now the publication of foreign correspondence from almost every part of the globe was a weekly incident.

Drs. L. M. McKillop and Edward H. Fyffe responded on behalf of the guests, and the Hon. P. C. Larkin, High Commissioner of Canada, proposed a vote of thanks to the chairman.

MISCELLANY

CONNECTICUT DEPARTMENT OF HEALTH

WEEKLY MORBIDITY REPORT FOR THE WEEK ENDING OCTOBER 25, 1924

(Including all cases reported before 11 A. M., Monday, October 27, 1924)

Diphtheria

Fairfield County	
Bridgeport	7
Danbury (C)	1
Stamford (C)	5
Stratford	3
Hartford County	
Hartford	4
New Britain	5
Southington	1
New Haven County	
Ansonia	4
New Haven	2
Waterbury	7
New London County	
New London	1
North Stonington	1
Norwich (C)	5
Norwich (T)	2
Tolland County	
Mansfield	1
Rockville	1
State total	50
Last week	39

The following diphtheria bacilli carriers were reported:

Guilford	1
Madison	46
New Britain	16
New Haven	9
Stonington	44

Whooping Cough

Fairfield County	
Bridgeport	1
Greenwich	4
New Canaan	1
Stratford	1
Hartford County	
Enfield	3
Hartford	2
West Hartford	1
Litchfield County	
Plymouth	3
New Haven County	
Cheshire	3
Hamden	1
Meriden (C)	1
New Haven	21
North Haven	1
New London County	
New London	8
Windham County	
Canterbury	8
State total	59
Last week	51

Scarlet Fever

Fairfield County	
Bridgeport	8
Danbury (C)	1
Greenwich	3
Shelton	1
Stamford (C)	2
Hartford County	
Bristol	1
East Hartford	1
Hartford	6
New Britain	10
Litchfield County	
Litchfield	3
Plymouth	1
Thomaston	6
Middlesex County	
Cromwell	1
New Haven County	
Madison	2
Meriden (C)	2
New Haven	10
Orange	1
Seymour	3
New London County	
Bozrah	1
Colchester	3
Lebanon	1
Norwich (C)	3
Windham County	
Putnam (C)	9
Putnam (T)	4
State total	83
Last week	56

Typhoid Fever

Fairfield County	
Bridgeport	2
Fairfield	1
Hartford County	
New Britain	1
New Haven County	
New Haven	1
West Haven	1
State total	6
Last week	6

Measles

Litchfield County	
Plymouth	1
Middlesex County	
East Haddam	1
New Haven County	
New Haven	4

Other Communicable Diseases

Cerebrospinal men.	1
Chickenpox	11
Encephalitis epid.	1
German measles	1
Influenza	4
Mumps	7
Pneumonia (lobar)	23
Poliomyelitis	2
Septic sore throat	1
Trichinosis	2
Tuberculosis (pul.)	23
" (other forms)	4
Gonorrhea	10
Syphilis	33

THE HEALTH OF ENGLAND AND WALES

ANNUAL REPORT OF THE MINISTER OF HEALTH

THE annual report of Sir George Newman, Chief Medical Officer of the Ministry of Health of England and Wales, has been issued recently. The report is for the year 1923 and is of high literary merit as are all Sir George Newman's writings, as well as being a valuable document from many points of view. He terms the review of a nation's deaths, births and diseases as that of a record year. True there was a decline in the number of births of 22,000 on the number for 1922 and of 90,000 on that of 1921. In fact, only in 1919 was a lower figure recorded. At the same time, a birth-rate of 19.7 was counterbalanced by the lowest death-rate ever experienced by the country. The deaths totalled 444,786, or 42,000 less than in 1922.

The death rate was 11.6 per 1,000. In addition the infant mortality rate was the lowest ever recorded, being only 69 per 1,000 born. Forty-five thousand babies' lives were saved over and above the average saving in 1901-10 which he refers to as perhaps the greatest recent triumph of preventive medicine. This on the face of it appears to be a triumph of modern preventive methods and he claims it as such. While at the same time, he agrees that it is fallacious to measure health conditions wholly by changes in the general death rate, and it must further be taken into account that the low mortality record was assisted by meteorological conditions conducive to the health of infants and elderly persons as also by the absence of widespread epidemics. He emphasizes the point that the true health problem of a nation centres rather in the question of sickness and physical impairment, that immense burden of suffering which helps to fill the hospitals and asylums, which robs industry of its fullest productivity, and which is the principal cause of physical inefficiency. It is to be noted that this general sickness and invalidity is largely unmeasured and unregistered, though much of it lays the foundation of mortal disease, and, moreover, much of it is preventible. Proof of the

immensity of its dimensions is afforded by a survey of the amounts distributed in sickness and disablement benefits last year to the working population of England and Wales. Under these two heads alone a sum of no less than £7,632,000 ($38,150,000) was paid out to men and £3,827,000 ($19,135,000) to women, a total of £11,559,000 ($57,795,000). Sir George Newman contends that probably the loss of time due to sickness, most of which is avoidable, costs the country not less than ten times more than that which it loses owing to strikes and labor disputes. For example the total number of weeks represented by the sickness and disablement payments in 1923 may be estimated at about 6,750,000 weeks' sickness and 6,000,000 weeks' disablement for men; and at 4,250,000 weeks' sickness and 3,500,000 weeks' disablement for women. These figures, which do not include the first three days of incapacity for which sickness benefit is not payable, give a total of 20,500,000 weeks' lost work in 1923, on a period of 394,230 year. That is to say, in England and Wales there was lost to the nation in the year, among the insured population only, and excluding the time, reduction of production and suffering, disablement benefit is not payable, the equivalent of the work of 394,230 persons. And it must be borne in mind that it is not only the working equivalent of 394,230 persons that was lost, but also the labor and expense involved in their care during their incapacitation. The report goes on to point out that in addition to the loss of time, reduction of production and suffering, discontent and premature death brought about by national ill-health, the people of England and Wales are still the victims, and in some cases the willing victims of smallpox and venereal disease. Influenza and encephalitis lethargica, bronchitis and pneumonia, tuberculosis and cancer still demand a heavy toll. It is noted that far too many deaths occur under 50 years of ave. It is stated in another part of the report that 40 per cent of the deaths in 1923 were under this age. In the view of Sir George Newman particular attention should be paid in the immediate future to the education of the people in hygiene, to wide and comprehensive concentration on the strongholds of disease, to careful coördination and direction of means to ends, and to systematic research and investigation. He holds that education in hygiene must begin in the elementary schools and continue throughout life. Particular attention should be directed to personal hygiene and the right use of the right foods. In one section of the report the relationship of health to dietary is dealt with. He makes a strong plea for a sound public education with regard to dietetics and then refers at some length to the question of milk. He compares the care of milk in America to that in this country greatly in favor of the former and highly praises the bottling system. The report gives a survey of the National Insurance Acts in England and Wales in which it is noted that in 1923 there were 12,555 insurance practitioners and the average number of insured persons on a doctor's list was 992. Only 2.1 per cent of these have lists of over 3,000 persons, and none in this category work single handed, while under 14 per cent have lists of 2,000. There were 9,126 druggists' shops for the supply of medicines and appliances to insured persons and the number of prescriptions dispensed was approximately 38,000,000 at an estimated cost of £1,516,000 ($7,580,000). The number of insured persons entitled to medical benefit was about 13,320,000.

The increasing prevalence of smallpox is referred to and it is stated that since 1920 the figures in England and Wales have been going consistently upwards. The outbreaks have been usually of a mild type especially in comparison with the records of the pre-vaccination days. It is observed that there were seven districts which had more than 100 cases each, and these were all places in which the vaccination of infants had been seriously neglected, and where the population had not sufficiently availed themselves of the facilities for vaccination when smallpox appeared.

Figures regarding other diseases given in the report are both interesting and instructive. It is shown as was shown in the report of the previous year that the largest number of deaths was owing to diseases of the heart. In 1923, 125 of each 1,000 deaths were due to diseases of the heart, 109 to malignant cancer, and 107 to diseases of the nervous system. The most marked decline was in diseases of the respiratory system, which were responsible for 71,711 deaths, as against 88,044 in 1922. There was a reduction in deaths from diseases of the heart from 59,837 to 56,886. Deaths from diphtheria fell from 4,075 to 2,722. Deaths attributed to cancer were 48,667 or 1,764 more than in 1922. According to the report venereal infection has declined. Throughout the report stress is laid upon the need for combating disease by means of wholesome environment and healthy living. Even cancer is a disease says the chief medical officer to which broad principles must be applied. Surgical aid at an early stage of the disease is now the proper course, but he does not doubt that the time will come when men will understand that a healthy way of life, the true physiology of the normal functioning of the body, combined with some degree of natural or acquired immunity, will be our best protection against the scourge.

Sir George Newman insists that a higher standard of personal hygiene will be an important factor in diminishing sickness and mortality. He notes with appreciation a growing sanitary conscience. The elementary schools, public education in hygiene, the newspaper, and the immense influence of the sanitary measures of the local authorities, scavening, water sup-

ply, health visitors, housing, food inspection, the care of the sick are all exerting an effect which are changing the habits of a people. In a word, it is not one influence but many, not one operation but many and varied, which have, in typhoid as in tuberculosis, brought about an improvement.

VITAL STATISTICS OF LONDON

The Metropolitan Asylums Board has issued recently its annual report for the year 1923-24. This report deals with the vital statistics of London, an area of 121 square miles with a population of 4,564,109. It is pointed out that from 1900 to 1914, the total population remained steady. The period since 1914 has shown great fluctuations, but there seems good reasons for assuming that the normal population of London at the present time differs comparatively little in number from the average of the period 1900-1914. With respect to the birth-rate, the number of births was approximately 130,000 for each year from 1879 to 1903. When, however, at the beginning of this century, the population of London ceased to increase, the fall in the number of births, as evidenced by the decreasing birth-rate, was great and rapid, representing nearly 23,000 fewer births in 1914 than in 1902. This fall has become greater since. Thus, though the population remains practically the same in number now as at any normal period during the past twenty-five years, the number of children born is decreasing rapidly. The fact is that the age-constitution of London appears to have changed. The average age is higher, owing to the immigration of older people and the transfer of the family residential centres, where births are numerous, to the outer area.

As for the infectious diseases during the year ended May 31 last, the report states that the year would have been characterized by a low demand on the Board's infectious hospitals in view of the great fall in scarlet fever cases, had it not been for the occurrence of the epidemic of measles towards the end of 1923. The deaths from scarlet fever in London in 1923 were only 116, representing a rate of 2.27 per 1,000 of the deaths and .02 per 1,000 persons living. With regard to diphtheria another less satisfactory tale must be told. There was a high incidence of the disease during the scarlet fever epidemic, which occurred in 1922, and it was found to continue when the epidemic as a whole had waned, and it persisted, though in a modified degree, during the year 1923. Of course, typhus and enteric fevers occupy a relatively unimportant position in London at the present time. As a mater of fact the initiation and carrying out of sanitary methods on a wide scale have led to the complete disappearance of typhus fever. In evidence of this triumph of the enforcement of wisely conceived public health measures it may be stated that in the ten years, 1870-79, the cases admitted to the Board's hospitals numbered 1,661; in 1880-89, 591; in 1890-99, 95; in 1900-09, 57; in 1910-19, 14; and in the four years, 1920-23, none. Much the same degree of progress can be recorded with regard to enteric fever. A pure water supply, the supervision of the sources of the shell-fish and the nature of the fried fish used as food in the poorer quarters, in combination with other sanitary precautions, have resulted in a rapid and great decrease in the prevalence of this disease, which so far as demands upon the Board is conceived has now been relegated to a position of quite minor importance. On the other hand, another disease has become a public menace within recent years. So called "sleepy sickness," encephalitis lethargica, made its first appearance in London as a disease to be regarded with special consideration in 1917. The annual notifications, since 1920, when the malady became first formally notifiable in 1920, have been as follows: 1920, 141; 1921, 233; 1922, 67; 1923, 101; first five months of 1924, 337. Attention is directed in the report to a point which, if not significant, is at least interesting, namely, that London appears to experience a greater incidence of measles about every two years. The last year when this incidence was great was 1922. The disease is not generally notifiable in London and consequently no statistics are available of the total number of cases that occur annually. Some indication as to its prevalence during 1922 may, however, be gathered when it is pointed out that leaving out of consideration children below school age, and measles is a disease to which young children are very susceptible, some 34,385 cases were reported by the head teachers as occurring among children attending the London County Council's schools. Having regard to the two-year cycle, it was anticipated that 1924 would be a year of high incidence, and towards the end of 1923 the number of cases the Board was asked to receive showed a marked increase. The number of tuberculous patients under treatment on May 31 last in the Board's institutions for the treatment of tuberculosis only was 1,580. In the metropolitan area 25,950 cases of infectious disease, exclusive of chicken-pox, tuberculosis, whooping cough and zymotic enteritis were notified during the year 1923, or 14,544 fewer than in the previous year, and 29,035 fewer than in 1921. In the Board's mental hospitals and epileptic colony, the number of patients on Dec. 31, 1923, was 8,843. During 1923, 1,278 patients were admitted, 329 were discharged, and 645 died. The average annual number of admissions during the past five years has been 1,507. In view of the scientific interest shown in the subject of cancer research, it is noteworthy that the deaths from cancer among the patients certified under the Lunacy Acts in the deaths in the Board's mental hospitals occurring among patients aged 45 years and upward are very low compared with the

cancer mortality for London among the ordinary public at corresponding ages, the percentages in 1923 being 3.4 and 16.74 respectively.

EPIDEMICS ARE HALTED DURING WOOD REGIME

SINCE 1921, when Governor General Wood took office, the death rate in the Philippine Territory has been reduced 14 per cent and there are no serious epidemics of any kind threatening the population, according to official figures just given out in Manila. During the previous administration there were four cholera epidemics with a death toll of more than 17,000, and two great small-pox epidemics which caused more than 73,000 deaths. Both of these diseases have been virtually eliminated in the Philippines.

THE TRUDEAU SOCIETY OF BOSTON

THE second meeting of the Trudeau Society of Boston was held at the Harvard Club on October 30, 1924. The Committee to draw a Constitution and By-Laws, and to nominate officers for the ensuing year, met and reported and the following officers were elected: Dr. John B. Hawes, 2d, President; Dr. Vincent Y. Bowditch, Vice-President; Dr. Olin S. Pettingill, Secretary and Treasurer. These together with the following were to constitute a council: Dr. Edward O. Otis, Dr. Ralph Leonard, Dr. Henry D. Chadwick, and Dr. Frank Hunt. The proposed draft of the Constitution and By-Laws with certain corrections and changes was accepted.

It was voted to call this Society "The Trudeau Society" and that it constitute the Clinical Section of the Boston Tuberculosis Association.

The object of this Society is to promote the study of tuberculosis and other diseases of the lungs.

It was voted to have four meetings annually and to limit the membership to fifty.

Dr. John B. Hawes, 2d, President of the Boston Tuberculosis Association, and Dr. Eli Friedman, physician at Prendergast Preventorium, which is supported by the Association, presented a paper on the results of their studies with children with tuberculous hilus glands at that institution. In this paper the wide differences of opinion among roentgenologists as to the interpretation of X-ray films was made apparent. The lack of value of the so called d'Espine sign and the Eustace-Smith sign was spoken of. The value of other signs in the diagnosis of this condition was discussed.

A very frank and stimulating discussion followed the reading of this paper. Among those taking part in it were Dr. John B. Hawes, 2d, Dr. Henry Chadwick, Dr. Edward O. Otis, Dr. Cleaveland Floyd, Dr. Joseph H. Pratt, Dr. T. J. Murphy, Dr. L. B. Morrison, and others.

OLIN S. PETTINGILL, M. D., *Secretary.*

AMERICAN MEDICAL ASSOCIATION

COUNCIL ON PHARMACY AND CHEMISTRY

IN addition to the articles enumerated in our letter of September 27, the following have been accepted:

Battle Creek Food Company—
Lacto-Dextrin.

Eli Lilly & Co.—
Pituitary Extract-Lilly (Obstetrical):
Pituitary Extract-Lilly (Obstetrical), 0.5 c.c.
Pituitary Extract-Lilly (Obstetrical), 1 c.c.
Pituitary Extract-Lilly (Surgical):
Pituitary Extract-Lilly (Surgical), 1 c.c.

Medical Laboratories, Inc.—
Culture Bacillus Acidophilus-Medical Laboratories, Inc.

Merck & Co.—
Barbital-Merck
Barbital Sodium-Merck
Carbon Tetrachloride-Merck Highest Purity "C. P."

H. K. Mulford Company—
Cargentos Capsules, 3 grains
Cargentos Ointment, 5 per cent.
Diphtheria Toxin-Antitoxin Mixture New Formula (Park Benzhaf 0.1 L+ Dose)—Mulford.

Nutrivoid Diabetic Flour Company—
Nutrivoid Flour.

Parke, Davis & Co.—
Antidysenteric Serum—P. D. & Co., 20 c.c. syringe.

Powers-Weightman-Rosengarten Company—
Quinine Ethyl Carbonate—P. W. R.

W. A. PUCKNER, *Secretary.*
Council on Pharmacy and Chemistry.

MONOXIDE POISONING

THE Buffalo Sanitary Bulletin warns us that the season is here when the danger from carbon monoxide poisoning is greater and more direct. There is no excuse for any one remaining in ignorance of the fact that an automobile exhaust in a closed garage may render the air deadly in a very few minutes. Professor Yandell Henderson of Yale has stated that a 15 horsepower engine can manufacture a cubic foot of carbon monoxide in a minute. At this rate a small car can make the atmosphere of a one-car garage or even a larger one deadly in five minutes. Twenty-five parts in 10,000 parts of atmosphere may be fatal, and since the gas

has a combining power with the blood 300 times greater than that of oxygen, with a strong affinity for the red corpuscles, it is easily understood why those poisoned do not revive promptly in the open air as do those poisoned by carbon dioxide.

In heavily travelled streets a blanket of gassed air is laid down for a distance of 10 feet from the ground sufficiently poisonous to cause headaches. To remedy this Professor Henderson suggests vertical exhaust pipes from automobiles which will discharge the fumes above the top of the cars where they would be dissipated in the air.

DEDICATION OF THE GEORGE ROBERT WHITE FUND HEALTH UNIT

On Saturday, Nov. 1st, at Baldwin Place in the North End of Boston, the first Health Unit, built from the income of the George Robert White Fund, was dedicated. A number of city officials and others prominent in Public Health activities participated in the opening programme. Mr. George Phelan, manager of the White Fund, conducted the program and introduced the various speakers.

Mr. White's bequest to the city amounted to more than five million dollars. He specified that the money be used to create "works of public utility and beauty." The mayor and members of the committee, acting as trustees of the fund, agreed that nothing could be more fitting to the memory of the donor and in accord with his wishes than the devotion of the bequest to the improvement of Public Health facilities in congested sections of the city.

The new building is admirably equipped for Health Center work. The basement furnishes adequate room for the different health agencies and a cafateria for nutritional classes. Instruction in nutrition will be an important branch of the work. Daily dental clinics will be conducted on the well equipped offices of the first floor. Here, also, periodic health examinations will be carried on, including fluoroscopic and X-ray work. A public conference room is situated on the first floor. The auditorium on the second floor, seating at least 250 people, will be used for public illustrations of health and hygienic methods. Recreational facilities for children are installed on the roof. Adjustable awnings make the roof convenient for the treatment of special cases. The staff of the unit comprises six municipal nurses and a nutritional worker.

The program opened with a few introductory remarks by Mr. Phelan. Rev. Wm. H. Dewart, pastor of Christ Church, then gave the invocation. Mr. Chas. N. Coolidge, architect of the building, presented the keys to Mr. Howard Coonley, President of the Boston Chamber of Commerce and one of the trustees of the fund. Mr. Coonley, as representative of the trustees, addrssed the gathering and formally presented the new unit to Mayor Curley, who received it and replied on behalf of the city. The Mayor passed the keys to Dr. Francis S. Mahoney, the Health Commissioner, who in turn gave them in final charge to Dr. Charles F. Wilinsky, Director of Health Units and Secretary of the Health League.

Dr. Wilinsky will have supervision of the work at the new unit. In the course of his address he outlined the extensive program that the health workers carry out through these units. This included, pre-natal care, well-baby conference work, pre-school age groups for child health examination and instruction in hygienic habit formation as well as inculcation of the principle of periodic health examination in the adult. Other speakers were Dr. David Edsall, Dean of Harvard Medical School. Dr. Haven Emerson, Professor of Public Heath Administration at Columbia University, and Dr. George E. Vincent, President of the Rockefeller Foundation. Dr. Chas. W. Eliot, President Emeritus of Harvard University, and Mrs. Harriet Bradbury, sister of the donor, were present on the platform. The speakers emphasized the occasion as an important step in advance in public health matters. In addition to this, they considered such a unit as another factor added to schools, libraries and hospitals that keep alive community interest and a sense of community responsibility. As Dr. Emerson expressed the thought, "the new building is a symbol of the most precious service that any civic government can render. With this visible expression of service the citizens will not forget their proprietorship in the affairs of government. From a more practical standpoint, the unit serves as a short-circuit station, transferring the discoveries of science into the common knowledge and practice of home-life."

Dr. Vincent, in the course of his dedicatory address,spoke in a most optimistic manner concerning this new venture in the field of public health. Nothing could be more gratifying, he thought, than to find private and civic health agencies working in complete coöperation as they are in Boston. Private agencies have begun and developed public health work in its various branches. It seems fitting that the work already developed should be taken over by the municipality. Dr. Vincent declared that Public Health ought to be in politics in the fine old Greek sense of the word, politics, and he believed it was. Into no field of government control does partisanship enter so little as it does into the field of Public Health. Here, if anywhere, selfish interests are laid aside and the public welfare is given conscientious consideration.

The transfer of public health enterprises from private to public hands will mean increased taxation. Education of public opinion and development of a sense of community responsibiilty must go hand in hand with this transfer. A

large part of public health work is still in private hands, however, and American citizens will need to continue their system of self-taxation for which they have been noted in the past.

In closing, Dr. Vincent expressed the value of the health unit, not only as a beautiful and useful place, but also as an emblem of the finer spirit in the community and as a bond of union beneath all differences of race and religion making citizens realize that the health of each is the concern of all.

F. A. PATTERSON.

PLAGUE IN LOS ANGELES

NOVEMBER 2 the daily press announced the outbreak of the pneumonia form of plague in Los Angeles, with the death of fourteen persons. The following day the deaths had increased to twenty-seven. The cases so far have been confined to the Mexican quarter, and a rigid police quarantine is being enforced.

MENTAL HYGIENE FOR SCHOOL CHILDREN

DR. FRANKLIN G. EBAUGH, Director of the Neuropsychiatric Department of the Philadelphia General Hospital, recently studied 50 school children referred to him by Philadelphia teachers. These children were studied from the point of view of their social background, and then given thorough physical and psychiatric examinations. If physical defects were revealed, these were corrected. If habits or mental attitudes were the chief problems a definite treatment was prescribed and carried on to improve them. After a year's treatment 29 of the children showed improvement and better adjustment in their home and school life. Dr. Ebaugh feels that work of this kind is part of the school's duty toward the child. He urges school physicians trained in mental hygiene, school neuropsychiatric clinics in association with medical clinics, and observation wards in general hospitals.—*Children's Bureau, Washington.*

NEWS ITEMS

APPOINTMENT OF MISS FLORENCE PATTERSON

THE resignation of Miss Mary Beard as General Director of the Community Health Association has been announced. After working in Boston for over twelve years, this information will be received with general regret.

Miss Florence Patterson, who for a year has been Miss Beard's associate as Director of the Division of Nursing, has accepted the position of General Director and assumed the duties of her new position on November first. Miss Patterson has had great experience in Public Health Work and the Association is very fortunate in having secured her services.

TUFTS COLLEGE MEDICAL SCHOOL

NEW APPOINTMENTS FOR 1924-1925

John Lincoln Ames, M. D., Professor Emeritus of Theory and Practice of Medicine.

Edward Norton Libby, M. D., Professor of Clinical Medicine, appointed Professor of Theory and Practice of Medicine, in charge of the Department of Medicine.

Arthur Ronald Kimpton, M. D., Associate Professor of Surgery, appointed Professor of Clinical Surgery, in charge of the Department of Surgery.

Harry Philip Cahill, M. D., appointed Professor of Otology, in charge of the Department of Otology.

Horace Binney, M. D., appointed Assistant Professor of Clinical Surgery.

James Joseph Hepburn, M. D., appointed Assistant Professor of Clinical Surgery.

Harold Ward Dana, M. D., appointed Assistant Professor of Clinical Medicine.

Anna Quincy Churchill, M. D., appointed Assistant Professor of Histology.

RESIGNATIONS

Frank Howard Lahey, M. D., from the Professorship of Surgery and Charles Davison Knowlton, M. D., as Assistant Professor of Theory and Practice of Medicine.

DR. CHARLES L. BROWN of Boston read a paper before the Section of Neurology and Psychiatry of the New York Academy of Medicine on Nov 4. Subject: Acute Serous Encephalitis; a newly recognized disease of children.

REMOVALS

DR. WILLIAM H. MORRISON has moved from Brockton (Plymouth) to Springfield (Hampden) where he has an office at No. 18 Wigwam Place.

DR. ALLEN P. WINSOR has changed his office from Marlborough St. to 472 Commonwealth Ave., Boston.

DR. F. DENNETTE ADAMS has moved from Washington, D. C., to Boston, and now has an office at 226 Marlborough St. in that city.

DR. HAROLD L. WALLACE has moved from Parkvale Ave. to 223 Harvard Ave., Allston.

DR. CHARLES C. CARROLL has moved from Dorchester (Norfolk) to Belmont (Middlesex South) where he is at 23 Stults Road.

DR. WALTER D. RIORDAN has moved from 187 Newbury St. to 281 Jackson St., Lawrence.

DR. PAUL L. HARRIS has returned to Lowell from Philadelphia and has his office at 50 Fay St.

DR. EDGAR H. HUGHES has moved from Turner's Falls to Greenfield, where he has an office at 31 Federal St.

DR. DWIGHT L. SISCO has moved from 171 Pilgrim Road, Roxbury (Norfolk) to the Mass. General Hospital, Boston (Suffolk).

DR. J. LEWIS MAHONEY has moved from 128 Chestnut St., Boston, to St. Petersburg, Fla., for the winter.

RECENT DEATHS

DR. BYRON LEE DWINELL died at his home in Taunton, October 29, 1924, at the age of seventy-five. Dr. Dwinell joined the Massachusetts Homoeopathic Medical Society in 1886, and was a life member. He was a graduate of the Boston University School of Medicine in 1878 and had long practised in Taunton.

DR. HENRY PORTER HALL died at his home in Leominster, November 1, 1924, at the age of 71. He was born in Kennebunk, Me., August 2, 1853, graduated from Bowdoin, in the medical department, in the class of 1874, settled in Leominster, Mass., and joined the State Medical Society in 1877. He was a member of the American Medical Association.

NOTICES

PHYSIOLOGICAL CONFERENCE

AT a meeting to be held Wednesday, November 19, in the Bowditch Library, Building C, Harvard Medical School, at 4 o'clock P. M., Dr. C. K. Drinker will speak on "The Isolated Mammalian Heart."

OPPORTUNITIES FOR INTERNISTS

THE attention of the editor has been called to two apparently excellent opportunities for medical men. In one instance a general practitioner in a town about twenty-five miles from Boston is giving up his practice and wishes to get a thoroughly reliable man to take his place; in the other a surgeon in a city in Maine believes that there is need for a well trained medical man who will do nothing but internal medicine. While the editor assumes no responsibility in regard to either of these openings, he knows more or less of the circumstances in both cases and feels that one function of the JOURNAL is to bring to the attention of as many men as possible such opportunities as these. If anyone interested will apply to him, he will supply the names of the persons directly concerned.

SOCIETY MEETINGS

Bristol South Medical Society

Next meeting will be held Thursday, November 6, 1924.

Essex North District Medical Society

January 7, 1925. Semi-annual meeting at Haverhill.
May 6, 1925. Annual meeting at Lawrence.

Essex South District Medical Society

Essex South District Medical Society's next meeting will be held Wednesday, December 3, at the Beverly Hospital. 5 P. M., clinic by members of the Staff. 7 P. M., supper. Speaker, Dr. John Homans, Boston, on "The Early Diagnosis of Carcinoma of the Large Intestine."

Hampden District Medical Society

Meetings to be held on the third Tuesday of January and the third Tuesday in April.

Hampshire District Medical Society

The meetings will be held the second Wednesday of November, January, March and May.

Dr. Channing Simmons will deliver an address at the November meeting. Title: "The Treatment of Cancer, with Especial Reference to Radiation."

Middlesex East District Medical Society

Wednesday, November 19. Harvard Club. Dr. George K. Pratt, "Community Aspects of Psychiatry."
Wednesday, January 21. Harvard Club. Dr. Franklin K. White, "Diagnosis of Gall-Bladder Disease."
Wednesday, March 18. Harvard Club. Dr. John H. Cunningham, "Urinary Retention: Its Significance and Treatment."
Wednesday, April 15. Harvard Club.
Wednesday, May 13. Colonial Inn, North Reading.

Middlesex North District Medical Society

January 28, 1925.
April 29, 1925.

Middlesex South District Medical Society

Winter Schedule—The plans for winter meetings of the Society include the stated meetings in October and April, two hospital meetings, and five meetings to be held in conjunction with the Suffolk District Medical Society and the Boston Medical Library (two surgical, two medical, and one general).

Norfolk District Medical Society

November 25, 1924. Masonic Temple, Roxbury. Subject: Diabetes—with especial reference to insulin. Speakers: Dr. Joslin and probably one other.
January 27, 1925. Masonic Temple. Subject: "Some Trends of Medical Teaching and Medical Practice." Speakers: Drs A. S. Begg and W. P. Bowers.
February 24, 1925. Masonic Temple. Subject: "The Need of Periodical Physical Examinations and How to Make Them." Speaker: Dr. Francis H. McCrudden. A second speaker will be selected to present another subject at this meeting.
March 31, 1925. Tufts College Medical School. This meeting given over to Drs. Leary and Watters for the purpose of giving us a medical examiners' talk.

Norfolk South District Medical Society

Meetings will be held the first Thursday of each month from October to May, inclusive, at 12 noon, at the Norfolk County Hospital, South Braintree.

Suffolk District Medical Society

December 17. Medical Section, in association with the Middlesex South District Medical Society. "The Newer Drug Treatment of Heart Disease," Dr. Paul D. White.
January 28. General meeting, in association with the Boston Medical Library and the Middlesex South District Medical Society. "Some Experiences of a Medico-legal Pathologist" (lantern slides), Dr. George B. Magrath
February 25. Surgical Section, in association with the Middlesex South District Medical Society. "Pyelonephritis," Dr. Arthur H. Crosbie.
March 25. Medical Section, in association with the Middlesex South District Medical Society. "The Treatment of Pneumonia," Dr. Edwin A. Locke.
April 29. Annual meeting. "Hypertension and Longevity," Dr. Harold M. Frost.

Worcester District Medical Society

December 10, 1924. Worcester State Hospital. Subject and speaker to be announced.
January 7, 1925. Surgical meeting. Place, subject and speaker to be announced.
February 11, 1925. Memorial Hospital, Worcester. Papers will be read by the members of the hospital staff.
March 11, 1925. St. Vincent's Hospital, Worcester. Papers will be read by the members of the hospital staff.
April 9, 1925. Subject and speaker to be announced.
May 14, 1925. Annual meeting.